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THE EFFECTIVENESS OF INCENTIVE PAYMENT SYSTEMS: AN EMPIRICAL TEST OF INDIVIDUALISM AS A BOUNDARY CONDITION

BY

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ABSTRACT

Incentive payment systems became more widely used by companies in the 1980s; their acceptance was supported by the predictions of theorists in disciplines such as economics and social psychology. These theoretical traditions have for the most part proceeded separately, but we argue, there is potential for combining these insights of different traditions to improve the predictive power of models of incentive pay. To this end, this study demonstrates the potential of an *interdisciplinary approach* to modelling incentive pay.

Closer inspection of current models finds that they are founded on assumptions of *rational economic man*, including calculative individualism. In practice, however, these assumptions often do not hold. We hypothesize that explicitly specifying individualistic values among employees as a boundary condition for the successful operation of incentive pay systems can improve models' predictive power.

Our hypotheses are tested by reference to a data set of the opinions of 1240 employees in 14 companies across England and Wales. An incentive pay model was found to have greater predictive power among relatively individualistic employees than among those of relatively collectivistic value sets. In addition, the incidence of an incentive pay system was associated with more effort being supplied among individualistic employees, but there was no significant difference in the effort supplied by collectivistic employees whether or not they are covered by an incentive pay system.

To my family.

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CHAPTER ONE - INTRODUCTION

1.1 Introduction

This thesis argues that incentive payment systems, which enjoyed a renaissance in Britain during the 1980s, have been analysed by an academic literature whose conclusions have been ambiguous. We argue that improving incentive models' predictive power favours an interdisciplinary approach. We further contend that models proposed should pay explicit attention to when and where their predictions are applicable - that is, to their own boundary conditions. These arguments are formalised as testable hypotheses and exposed to attempts at falsification by empirical evidence.

1.2 Increased Incidence of Incentive Pay

Since the late 1970s in Britain, there has been a proliferation in the number of companies practising means of paying employees which differ from traditional collective bargaining, (Smith, 1986). Schemes such as performance-related bonuses, profit-related pay and employee share ownership all provide a link between the income (or wealth) of employees and their performance at work. The directness of the link between pay and performance can vary widely depending on the system operated, but in general the increasing incidence of such schemes can be said to constitute an increase in the incentive element of the pay package, *ceteris*

paribus. Thus, the extent to which employees are materially rewarded for working harder is enhanced.

Evidence as to the extent of incentive pay in Britain, and to the scale of its extension in the last decade is difficult to report, because, with the exception of schemes requiring Inland Revenue approval to quality for tax relief[1], firms are not required to disclose publicly their means of paying employees. What figures are available, however, broadly support the anecdotal evidence of widespread and increasing use of incentive pay. The first Workplace Industrial Relations Survey (WIRS), carried out in 1980 among approximately 2000 establishments in the UK, found that 13 per cent of private sector workplaces operated some form of employee-share ownership scheme, (Daniel and Millward (1983)). By 1984 the second WIRS survey reported that this figure had almost doubled, to 23 per cent. Rises from 19 to 34 per cent incidence were recorded in the retail distribution sector, and from 16 to 32 per cent among electrical and instrument engineering establishments (Millward & Stevens (1986)). Smith

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[1] Since 1978 a variety of legislation has provided tax relief for designated payment systems. The Finance Act (1978) accorded relief to schemes which distributed free registered shares to all employees of five or more years standing. The Finance Act (1980) extended tax relief to Save As You Earn-funded share option schemes applicable to the whole work force. The Finance Act (1984) introduced tax concessions for discretionary share-option schemes. The Finance Act (1989) extended tax relief on designated Employee Share Ownership programmes to corporation tax. The Finance Act (1987) provided tax relief to registered profit-related pay (PRP) programmes in which at least 5 per cent of total pay varied with company profits. The Finance Act (1989) abolished this rate and increased the upper limit on tax free PRP to 74 000. The Finance Act (1991) increased the proportion of PRP which was tax exempt from 50 per cent to 100 per cent.

(1986) estimated that by 1985 41 per cent of publicly quoted companies in Britain operated at least one form of all employee cash or share-based profit sharing scheme. Following the 1987 Finance Act which introduced tax concessions for designated profit-related pay schemes, officially registered Profit Related Pay schemes grew in number from 145 in October 1987 to 1245 in February 1991, (House of Commons (1991)). One dissenting voice is IDS (1991) who suggest that payment by results schemes for manual workers have declined in incidence since the mid 1980s. Smith (1986) in a survey of 1125 companies, for the Department of Employment, found that for most respondents incentivating greater productivity from employees was indeed an objective of introducing both cash and share-based profit-sharing schemes.

1.3 Objectives of Thesis

The growing popularity of incentive pay systems has been supported by, and has given rise to, a burgeoning academic literature on incentive payment systems. This literature includes models of the effects of incentives on employee behaviour, and empirical tests of their hypothesised effects.

Despite the volume of academic literature, the effect of incentives on worker effort has yet to be conclusively established. We argue that one important reason for this is that research in the area of incentive pay has been undertaken by academics of different disciplines (principally economics

and social psychology) whose work has proceeded *separately* without reference to each other's tradition. This thesis aims to show that to a large extent economic and social psychological models of incentive pay are complementary rather than mutually exclusive, and that mining this complementarity provides greater scope for positive testing of the hypothesised effects of incentive pay. The more comprehensively these hypothesised effects *are* tested and found to be robust, the more confidence we can have in the predictions and prescriptions drawn from incentive pay models. Accordingly our first objective is to demonstrate the complementarity of economics and social psychological models of incentive pay. To do so we open up the 'black box' of causality in economics by specifying a hypothesised motivational process which is consistent with it, and testing empirically the resulting model.

A key dimension of the complementarity of economic and social psychological models of incentive pay is, we argue, their sharing a common set of assumptions concerning human decision making. Although rarely explicitly stated, both traditions base their models on assumptions of man as being engaged in the maximisation of his individual self interest. These assumptions have been variously called those of *rational economic man*[2] (Hollis and Nell (1975)), or more generally those of neoclassical theory. We argue, however, that the

[2] 'Man', in this standard term, imports both the masculine and the feminine.

extent varies to which these assumptions are met in practice. At different times, and among different people, values which guide decision making vary between being individualistic (and therefore *more* consistent with the 'rational economic man' assumptions), and collectivistic (in which case the assumed rationality is not such an accurate assumption). The predictions of models founded on assumptions of *rational economic man* are valid insofar as the assumptions are met in practice: where they are not, predictive power is not to be expected.

Despite the mutability of their assumptions, incentive pay models are typically presented as if ahistorically and universally applicable. This, we argue, undercuts their predictive power and leads them to be misapplied in certain circumstances.

Accordingly our second objective is to investigate this potential boundary condition of incentive pay models of behaviour. This has theoretical and practical importance. Firstly given the growing imperialism of economics in the social sciences (Harcourt (1981)), we aim to delineate the domain of models founded on assumptions of rational economic man. Secondly, by narrowing the conditions under which incentive pay can be confidently said to increase employee effort, practitioners can better focus their payment systems for greatest effect.

The question of *boundary conditions* for incentive models has been raised recently in the Decision Sciences literature (e.g. Miller & Grush (1988)), but research remains at a basic, pathbreaking level. Our objective is to develop positive hypotheses which formalise the contention, and to test them empirically using as broad a sample as possible.

1.4 Organisation of Thesis

The chapter which follows depicts and analyses the context in which the increasing incidence of incentive pay is set. Part of this context is argued to be a recent growth in individualistic values among British people, at the expense of collectivistic values. Given our hypothesis that incentive payment systems are most suitably applied to agents of individualistic value sets this context has important implications for our analysis.

Section Two sets out and develops theoretical perspectives on incentive pay. Two broad approaches are analyzed: that of efficient contracts in the economics tradition, and that of expectancy theory in the social psychological tradition. The indeterminacy of empirical tests of these models is established, and their potential complementarity emphasised as a means of improving their ability to be rigorously tested. Further, the two approaches are argued to share common methodological assumptions of calculative individualism. We

argue that people's values reflect to what extent these assumptions are met, and that since values can be demonstrated to vary over time and across people, incentive pay models should not be thought of as being universally applicable.

Section Three operationalises this body of theory into testable hypotheses. The hypotheses summarise a model of the motivational process which is consistent with economic models, as well as the projected boundary conditions of its applicability; that is, the presence of individualistic values.

Section Four specifies a data sample suited to the purpose of testing the hypotheses developed in section three. Empirical proxies are defined to represent the variables contained in our hypotheses, and these hypotheses are tested with reference to the data sample.

Section Five summarises the conclusions which our analysis has led us to, discusses their generalisability and, in the light of these, outlines the implications they have for theory and practice.

CHAPTER TWO- THE GROWTH OF INCENTIVE PAY IN CONTEXT

2.1 Introduction

Chapter One referred to evidence which pointed to an increased incidence of incentive pay. Why should the last decade have seen, in Britain at least, a proliferation in incentive pay systems? To answer this question requires that we outline the context in which the debate - *if* and *how* incentive pay motivates effort - is set.

If we think of an industrial relations system as one whose output is the set of customs and practices which govern the conduct of employment relationships, then it is clear that the ways in which people are paid is an important element of that set of 'customs and practices'. Accordingly, the context to be outlined is that of changes in the system of industrial relations which has given rise to incentive pay.

Some writers (eg Bassett (1986)) have argued that a major structural shift has taken place in the British industrial relations system over the last decade, to result in a New Industrial Relations. Others (eg Kelly & Kelly (1990)) have argued that change has been less fundamental.

To place this rise in incentive pay in context, then, we depict

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the tendencies for change in the system which produces it.

2.2 Change in the Industrial Relations System

A variety of frameworks have been proposed for analysing change in the industrial relations system. Dunlop (1958) argued that three groups of actors are involved in such a system: workers and their representative organisations, managers and their representative organisations, and the agencies of government concerned with work. Significant change in the system (resulting in new rules and customs at work) could be thought to stem from a significant change in either technology, the market context faced by actors, or the ideology prevailing within the system.

Chandler (1962) emphasised the importance of strategic choices made by actors in response to the environmental conditions which they face. He argued that these choices shape the structure of the industrial relations system. Chandler thus saw the influence of exogenous factors, whilst important, as acting through the medium of organisational responses.

Applications of Talcott Parsons (1951) analysis of social systems to industrial relations stress the endogenous pressures within a system, as well as exogenous pressures acting on it, in bringing about change. Change can be a result of variations in

the external environment, placing pressures on the adaptation function of the system to transmit the need for change throughout the system. Alternatively, the pressure for change may stem from strains within the system associated with internal misalignments. A crucial feature of Parsonian analysis of social systems is that exogenous and endogenous pressures in themselves will not necessarily bring about change in the system. Sometimes such pressures are present yet no changes occur. This is because the forces for change in the system remain weaker than the forces maintaining equilibrium. Such a framework is useful in explaining why incentive pay increased from the late 1970s but not before. The Parsonian framework also emphasises the interaction of the industrial relations system with other sub-systems of society, for example, the political system and the economic system.

Each of these three contributions offers useful analytical devices in depicting the industrial relations context in which incentive pay systems have proliferated. Parsons causes us to pay close attention to imports from other sub-systems of society. Chandler's view leads us to examine changes in the potential for organisations to make strategic responses. Dunlop focuses explicit attention on the key environmental influences of the market constraint and the mode of technology. Accordingly, to investigate the context of the increased incidence of incentive pay we identify the chief external and

internal pressures for change in the industrial relations system in the early 1980s. To this end we assess market pressures (product and labour), technological change, and changes in public policy and the values of actors. In so doing we assess the implications of each of these pressures for organisational responses.

2.3 The Market Constraint: Product Markets

Employment relationships exist, for the most part, to facilitate the production of some good or service which is eventually sold in product markets. It is clear, then, that changes in product market conditions will have implications for employment relationships: Brown (1987, p10) points to "the relatively greater importance of the product market than the labour market" in prompting changes in employment relations which aim for greater efficiency. Since product markets are in a continuous state of flux, so there will be pressures and opportunities which arise from these machinations which affect organisations' decisions regarding employment relationships: decisions which may lead to changes in the institutional structure of industrial relations.

Although its extent has varied from sector to sector, increased competition appears to be the *leitmotif* of product market conditions in recent years. We categorise this into three

sources: i) greater international economic integration, ii) the recession of 1980-82, and iii) increased domestic competition.

2.3a International Economic Integration

Increased product market competition derives from two sources: an increase in supply for any given demand, and/or a fall in demand for any given supply. This and the next subsection deal with the former.

Since 1982 world trade has increased markedly faster than the growth of output of the world economy. This implies that there has been a greater international interpenetration of markets, which suggests that the typical market has experienced a proliferation of competitors within it; that is, an increase in competitive pressures on incumbent firms. Such international economic integration stems from trade liberalization, through such treaties as GATT (the General Agreement on Tariffs and Trade) and European Community policies, as well as the rise of multinational corporations and the entry onto the world stage of the newly industrializing countries. Between 1980 and 1985 the volume of world trade increased by an annual average rate of 0.6 per cent faster than world output; this figure rose to 0.9 per cent between 1982 and 1986. The United Kingdom was particularly exposed to this growth of world trade. Between 1983 and 1988 the growth of visible imports exceeded the rate of increase of

real consumers' expenditure by a full 3.3 per cent. This implies increasing overseas competition in the United Kingdom's product markets.

This is not to say, however, that increasing international competition is an unprecedented phenomenon. Indeed, since 1960 it has been the typical case that the rate of growth of world trade should exceed that of production. It did so by an average of 5.9 per cent a year between 1965 and 1970, so that the growth of the recent past has not been at a rate which even approaches its historic performance. But whilst we should be aware that there has been no radical break with the past in the experience of global competition, this does not necessitate its exclusion as a force acting to determine a new system of industrial relations. International competition has increased cumulatively: it is possible that recent years have been exposed to a *critical degree* of competition for the first time which exhausted the capacity of firms to respond in such a way as to leave the industrial relations system intact. Alternatively it could be that it was the coincidence of this increasing international competition with the other factors which we will discuss which instigated radical organizational responses at this time.

2.3b Domestic Competition

Within UK domestic industry there appears to have been a relative proliferation of suppliers in recent years. Competition within an economy has traditionally been measured by analysing concentration statistics. However imperfect, it is generally held that a rising concentration ratio within an industry, and to a lesser extent the aggregate concentration ratio of the economy, can be taken to imply a tendency to lessening competitive pressures.

Aggregate and industrial concentration ratios both experienced sharp increases during the 1950s and 1960s. By the mid 1970s this upward drift had slowed, and evidence suggests that from the late 1970s the ratios actually fell. Hart (1985) calculates that between 1979 and 1981 the share of the 100 largest firms by output in manufacturing fell from 42.2 per cent to 40.6 pwe cent. In terms of employment this fall was from 37.3 per cent to 36.4 per cent. This tendency also holds true for average industrial concentration in manufacturing industry. Hart found that over 1980-81 the modal change in the 5 firm employment concentration ratio of Standard Industrial Classification (SIC) 3 digit groups (excluding those groups experiencing a change of less than 2 per cent) was -3 per cent.

For the divisional SIC groups 1-4, the arithmetic mean

employment five firm concentration ratio changed, between 1979 and 1981 by:

Division 1	Energy & water supply	+0.5 per cent
Division 2	Metal manufacture etc.	-1.34 per cent
Division 3	Metal goods, engineering	-1.3 per cent
Division 4	Other manufacturing	-0.9 per cent

This is clear evidence that the aggregate concentration, 4 digit industry concentration and 3 digit industry group concentration declined after 1979. Set against the rising trend during most of the post-war period, this implies an increase in product market competition in the UK from 1979.

These results are supported by data on company registrations. New companies being formed are an important potential source of increased competition for incumbent producers. Between 1979 and 1986 the number of British registered companies has increased at an annual average rate of 8.5% compared with 2.7% between 1972 and 1979. Figures for VAT registrations reveal increases of registrations less deregistrations of 22% for all industries between 1980 and 1988, with above average increases in most services categories, as well as in the production and construction industries. This increase in the number of businesses has been attributed to the decentralisation and contracting out by large firms of activities previously carried

out in house. If true this supports, rather than diminishes, our contention that product market conditions have become more competitive in recent years: if a company sells off its distribution division, say, that division is now in direct competition with incumbent firms in the distribution industry, increasing effective competition there.

Another way in which effective product market competition has increased within the UK is as a result of declining unionisation. If all firms in an industry are unionised then it would seem likely that the objectives of collective bargaining, pay and working conditions, will have a greater tendency to uniformity than an industry in which some firms are unionised and others union free. This will be particularly true where the same union is dominant in every firm in the industry, eg National Union of Seamen (now merged into the Rail, Maritime and Transport Union). Now if non-unionised firms enter such an industry they will not be bound by the pay and practices common to the other firms, and hence may vary them in order to achieve a competitive advantage over incumbent firms. As such non-union firms enter a previously unionised industry in increasing numbers, pay and practices, formerly a given, become sources of competition between firms. It follows from this that declining unionisation in an industry may be taken to imply increasing competition there.

New firms have, since 1979, shown themselves to be less likely to be unionised than existing firms. This makes for a tendency for the unionisation of industries to fall over time, implying this increase in domestic competition which we have described.

2.3c The 1980-82 Recession

At a time when, as we have seen, overseas and domestic suppliers were competing with increasing intensity for British custom, the demand for goods and services collapsed in the recession which hit the global economy at the beginning of the 1980s. The causes of the recession does not concern us here. It may have been policy-induced, or a symptom of an endogenous cyclical mechanism, or a combination of a number of different factors. What is incontrovertible is that between 1979 and 1981 demand in Britain fell by a real 3.3 per cent. Firms in the British economy therefore faced a sudden increase in product market competition as more potential suppliers chased this shrinking demand.

Across the sectors of the economy experience was uneven: the well-established accelerator principle could be applied to predict that the capital goods supply industry would be particularly badly hit, and income-inelastic products such as foodstuffs may be expected to have been more resilient. For this 3.3 per cent fall in demand between 1979 and 1981 the

output of British manufacturing industry fell by 14 per cent. Amongst the worst hit sectors were textiles (recording a 29 per cent fall over this period), motor vehicles (26 per cent) and mechanical engineering (16 per cent).

Many British firms were driven to the wall during the recession, entailing an overall shrinkage of British industrial capacity. This may be argued to have constituted a force for diminishing competitive pressures, in that potential future supply was declining; constrained capacity during the subsequent upswing may well have lessened the exposure of firms to product market competition. What is clear, however, is that at the *time* of the recession British firms felt the force of competition very strongly. For many firms the choice between making radical responses or inertia was the choice between survival and bankruptcy.

2.3d Implications for Organisational Responses

We have suggested that British industry has, since 1979, been subject to increasing competition in product markets. Some of this is new and some represents the continuation of past trends. Particular sectors of industry have been more exposed than others. What implications, then, does this have for organisational responses? We categorise them into two: pressures for organisations to respond in certain ways, and

greater opportunity to make responses.

To be viable in the context of increasing competition firms must strive to be price competitive, to offer acceptable quality of service and to be able to respond quickly and efficiently to changing conditions. The environmental conditions, after Chandler (1962), will therefore place pressures on firms to make strategic responses which accommodate these requirements. Now whilst it would be naive to expect labour to be the sole focus of firms' responses to increased competition, it remains the case that labour is an important cost in production processes. Hence we would expect organisational responses to include changes in the use of labour: insofar as this breaks previous norms and establishes new ones, it brings about changes in the industrial relations system.

Organisational responses which we can expect to be made, therefore, include pressure to cut the unit cost of labour, which may be done by holding down wages or introducing ways to improve productivity. As we discuss in the chapters which follow, incentive pay is widely advanced as a means of increasing the productivity of employees. Hence innovations in incentive pay are prominent in the responses called for by increasing product market competition. In addition, measures may be taken to improve product quality by altering work practices as in the introduction of new technology. Firms may

employ strategies designed to introduce greater flexibility both in the functions of labour (occupational flexibility) and its use (employment flexibility).

The *opportunity* presented for firms to introduce strategies which change the industrial relations structure in ways which were previously infeasible stems from the effects of competition on the workforce. As workers and unions recognise that competition is such that failure to accede to institutional change is liable to result in a firm's contraction or bankruptcy, with the consequent loss of jobs, then bargaining power shifts significantly to firms at the expense of unions. This has the effect of making it easier to enact changes which employers may have felt desirable for some time.

Thus we expect that product market competition will result, *ceteris paribus*, in organisational responses which are associated with a change in the industrial relations system, and which, in particular, provide a facilitating context for innovations in pay systems.

2.4 The Market Constraint: The Labour Market

The changing conditions of the labour market constitute one of the principal pressures on organisations: the availability of labour can influence whether a production process is capital or

labour intensive, and what types of labour are used; decisions which have important ramifications for the industrial relations system.

We can view the labour market conditions from two positions: supply and demand-side factors. However we must recognise that these two categories are not independent; for example, high labour demand can bring forth its own supply by raising participation rates.

On the supply side the demographics of the labour force determine the supply of labour available at any time. In recent years there have been two important developments here which imply pressure for change. The first is narrowly demographic: the baby boom generation of 1960s births began to join the labour force during the 1970s and peaked in the early 1980s. As Ermisch (1983) notes, "the average annual increment to the labour force arising from demographic sources during the first half of the 1980s is the largest experienced since the last war". The implications of this are important: i) the labour force was growing rapidly, implying, *ceteris paribus* more competition for a given number of jobs, and ii) a 'youthening' of the labour force, in which the importance of the cohort with few skills and little experience, but equally with fewer preconceptions about industrial relations practices, increased relative to that of experienced workers.

The second phenomenon on the labour supply side was the increase in the participation of women in the labour force. Although this was a phenomenon which had been present throughout the post-war period, unlike the essentially ephemeral baby boom, the cumulative pressure built up throughout: women were increasingly a source of labour amenable to part-time working. This afforded an important competitive opportunity for employers: there had been a secular decline in the hourly earnings of part-time female workers, relative to full-time men and women (Ermisch (1983), p144), and in addition the indirect costs were lower, with provision for paid holidays, paid sick leave and pensions generally lower for part-timers. Moreover, part-time workers' lack of rights to redundancy payments provides an important opportunity to exploit the flexibility of increasing numbers of women willing to work part-time. Brown (1987) records the proportion of part-time employees in the UK labour force increasing from 9 per cent in 1961 to 23 per cent in 1987.

At the same time as these phenomena in labour supply were being manifested, so important changes in demand were coming about. The severe recession, preceded by a slower contraction in labour demand from 1979, caused unemployment to rise. The combined effect of the recession and the demographic trends made for a level of unemployment which was the highest since the 1930s.

2.4a Implications for Organisational Responses

What implications do these changes have for organisational responses? The rise in unemployment generally greatly increased the bargaining power of firms with respect to unions, whose members had cause to fear redundancy. This provided an *opportunity* for firms to make radical responses to pressures they had felt, but had felt unable previously to force by unions. Rising proportions of young, part time and women workers made for an increasing section of the labour force in which unionisation was low, and the flexible nature of their employment made it difficult for unions to establish a continuing presence amongst them. This made collective bargaining increasingly difficult, and made union-sponsored occupational rigidities difficult to maintain. Equally, as new entrants to the labour force these groups of workers did not carry with them the baggage of years of involvement in industrial relations precedents, and could therefore be expected to be more responsive to new employer initiatives, including incentive pay.

2.5 Technological Change

"We are currently experiencing a technological revolution which is no less fundamental in its ramifications for the occupational structure in Britain than the advent of industry itself in the

latter part of the 18th century", (Poole *et al.* (1984, p49)

Technology is the way work is organised in order to transform a material from one state to another. It is therefore no more than a truism to say that technological change affects work. Since an industrial relations system comprises the institutions and practices which govern work, there is a clear link between technological change and pressures to make organisational responses which will change the system of industrial relations. If for each mode of technology, *ceteris paribus*, there is an optimum system of industrial relations which allows its fullest exploitation, it follows that to achieve the full competitive advantage which new technology can offer requires making accommodating changes in the system. In addition new technology can be potentially labour-saving, a factor which can give greater bargaining power to employers thereby making organisational responses which alter the IRS easier to implement.

In the classic industrial sociological view (eg Batstone *et al.* (1987)) there are three stages of industrial development:

i) craft production

ii) mass production

iii) fully automated/ process enterprises

It is argued that in recent years, with the microelectronic

revolution, we have been experiencing a transition from stage ii) to stage iii).

Stage ii) is characterised by the 'Fordist' mode of production which makes use of mass production, assembly line techniques. The opportunity to exploit this technology gave rise to facilitating organisational responses, which can be characterised as a view of the organisation as a machine with personnel as a mechanical component part being controlled by other parts of the machine. Drawing on the work of F W Taylor, workers' functions were minutely refined and defined. Accommodating responses which determined the industrial relations system were predicated on the need for collectivism, the individuality of workers having been submerged. Trade Union representation and collective bargaining became the dominant form of organisation. The narrow definitions of occupations became settled, and as workers organised in trade unions along these occupational lines a wage hierarchy developed between these various occupations. The role of the worker as an anonymous tool in the industrial machine meant that substitution of workers was straightforward so that little effort needed to be devoted to gaining employee commitment. Similarly the lack of discretion required on the part of the worker resulted in very little role for autonomy. The combination of this lack of involvement in company thinking on the part of the shopfloor worker and the qualitative dichotomy between the largely manual

tasks of the shopfloorworker and the essentially cerebral activities of management entailed little interaction between the two groups.

However the increasing application of new microelectronic technology since the late 1970s has brought us to stage iii) of the progression. Routine functions can now be increasingly automated, be it the production-line construction of automobiles, or banks' dispensing of cash. One of the effects of this trend is that work becomes less demanding physically and more so mentally. In addition computer-aided technology has made short production runs feasible, as well as more individually tailored product designs. With this new technology there is a tendency for the employee to be less the tool of a machine, and more a regulator of machines; monitoring, diagnosing and adjusting them. As such, the activities of workers are increasingly made in response to stochastic rather than deterministic conditions.

This new technology does not sit easily with the type of industrial relations system which emerged in response to the last mode of technology. The increased importance of *individual* discretion and judgement is not matched by industrial relations structures which emphasize worker homogeneity and collectivism. The need to respond stochastically requiring a large repertoire of responses means that rigid job demarcation lines are an

obstacle to the optimal exploitation of this new technology, and single occupation trade unions, the reinforcers of these lines, doubly so. As workers' jobs increasingly resemble those of supervisors and managers, and as their monitoring role brings ordinary workers into day-to-day contact with higher grades, so the 'us and them' dichotomy implicit in the old system of industrial relations becomes less appropriate.

As the *individual*'s skills and judgement become increasingly important so the value of talented and experienced individuals increases. Hence structures based on the easy replacement of employees constitute a drain on the firm, and gaining the most from employees becomes important but is frustrated by blanket collective bargaining.

In short the system of Industrial Relations which was set up in response to the Fordist mode of technology can be argued to block firms exploiting fully the competitive advantage of the new technology. This will lead to pressures on organisational responses to be such as to accommodate the new technology. What form are these changes likely to take?

2.5a Implications for Organisational Responses

A key strand which runs through the changes in technology of recent years is the increasing importance of the individual.

Logically, this would imply that employment practices should be under pressure to allow more room for individual decision-making. Equally, introducing policies aimed at generating the commitment and productivity of individual employees will be an accommodating set of organisational responses. As the principal *collective* agency in the workplace, an opportunity is presented by new technology to erode the control of workers voices by trade unions.

The greater is the extent of incentive pay in the employment contract, the smaller is the proportion of pay covered by collective bargaining, which is geared to fixing a 'rate for the job' for *groups* of workers. Even policies such as profit-sharing and team bonuses, although they refer to groups, represent a greater licence for *individual* decision-making within the groups (including, for example, peer group monitoring) relative to collective bargaining, in which individuals' decision-making is delegated to trade union officials.

Where work becomes more easily attributable to the individual, individual incentive schemes become both appropriate and feasible responses to changing technology.

2.6 Public Policy

Acts of Parliament passed and repealed since the middle of the last century have played an important role in shaping the industrial relations system. Some pieces of legislation will change an aspect of the institutional structure directly and deliberately, and these and others will have further repercussions on the industrial relations system through ways in which organisations react to changes in the law. As in the case of the other changes in environmental conditions, legislative changes cause organisations to react in two ways: i) by imposing new pressures and requirements on organisations, or altering existing ones, and ii) by creating opportunities for organisations to react for the first time, or in different ways, to pressures which were already present.

The present Government has targeted industrial relations as a major recipient of its legislative attention. The most pertinent aspects of the legislation are briefly summarised:

In July 1979 orders were made which extended the minimum qualifying period for employees to have worked in order to be able to initiate unfair dismissal proceedings. In addition the minimum period during which employers were bound to delay for consideration redundancies of 10-99 employees was reduced.

The 1980 Employment Act introduced into the procedure for hearing unfair dismissal cases consideration of the firm's size and its financial position. It limited the strength of closed shop agreements, banned much secondary picketing and provided state funds for secret ballots and elections.

The 1982 Employment Act went further. Secondary picketing was further curtailed and restricted to issues 'wholly or mainly' related to the narrow issue of terms and conditions of employment. Trade unions' immunity from court action for damages was restricted. Clauses in commercial contracts specifying the employment of only union labour were made void, and closed shops could be maintained only if an overwhelming majority of the workforce voted in favour at regular intervals. Larger companies were required to state annually in their Directors' Report what the firm was doing to further employee involvement.

The 1984 Trade Union Act focused on trade union democracy. It introduced a requirement that unions' governing bodies be elected by secret ballot. If unions were to retain their immunity against damages following a strike call, the call had to be preceded by a secret ballot. In order for unions to establish or maintain a political fund their members must vote in favour each ten years.

The Employment Act 1988 extends the requirement that union representatives be elected, and enabled any union member to force a pre-strike ballot through the courts. Unions were forbidden from disciplining members for non-compliance with a strike call and all dismissals of workers for non-membership of a trade union were outlawed. Trade unions were precluded from using their fund to indemnify individuals against court fines or damages.

In addition, mention has also been made in section 1.2, of the *specific* legislative encouragement of incentive pay systems such as employee share ownership and profit-related pay.

2.6a Implications for Organisational Responses

One of the principal effects of public policy was to improve the ability of firms to make responses which unions were likely to oppose. Indeed the legislation was widely seen as a reaction to unions' having allegedly usurped management power during the 1970s; a move to redress the balance.

More specifically among forces for change unleashed were a major impetus against collectivism and in favour of individualism. The progressive erosion of the legitimacy of the closed shop has reduced the extent to which firms can deal with union officials only as the representatives of its workforce. They had to take,

therefore, a more individualistic view of their staff both in terms of detecting their concerns and responding accordingly. The reduction in the authority of union leaders in strikes has made it important for the firm to communicate directly with its workforce: with the requirement of one man-one vote secret ballots, and workers free to ignore strike calls or return to work at any time without sanction, employers have a strong incentive to influence workers as individuals in order to prevent or break strikes. To be successful in this, firms need to foster a commitment to the company and its management *before* strikes, and to familiarise workers with the commercial imperatives facing the firm. This constitutes a pressure, then, to inform and involve workers more in the company's commercial position, often another aim of incentive pay systems such as profit-sharing and employee share ownership. Such pressure was heightened by the tax advantages of profit-related pay and employee share ownership, and by the new requirement to report annually on communication with, and involvement of, employees. In addition the measures related to strikes , insofar as they made strikes less likely, made it easier for firms to introduce new technology and policies such as incentive pay, which unions (in defence of collective bargaining) might be expected to oppose.

2.7 Values

Both Parsons and Dunlop stress the importance of the values or ideology binding together the actors within a system, and underpinning the institutions which result from it. The exact place of values within an analysis of changing industrial relations is difficult to pin down, however, with much feedback and interdependency between values and other variables. For example, the values of the electorate may be expected to influence the direction of public policy. Yet at the same time, environmental circumstances, including government action, can mould the values of actors. But if such relationships make for an entangled knot, it is possible nevertheless to discern, since the late 1970s, a rise in values associated with individualism at the expense of those associated with collectivism.

The prevailing values of collectivism until the late 1970s are reflected, for example, in rising levels of trade unionisation. Unions came to be recognised as a vehicle for social progress (in a way reminiscent of Roosevelt's New Deal in the US), and were accordingly incorporated into the decision-making process of government during the 1960s and 70s. The predilection for collective provision saw the construction and extension of the welfare state and the periodic nationalisation of sections of British industry. The growth of government both as a provider of goods and services, and as an arbiter of the functioning of

an increasing number of aspects of the economy, told of a trust in its collective role.

The breakdown of the potential post-war consensus was undoubtedly encouraged by the perceived failure of *collective* institutions to contribute to economic success by the mid 1970s. The behaviour of trade unions in that decade, in particular, led to them being viewed more as defenders of narrow interests than as a power for social good. The economic crisis of stagflation in the 1970s undermined confidence in the model answers supplied by the consensus.

The emergence of a greater individualism in the last decade no doubt is fostered by environmental conditions such as the changing nature of technology introducing a growing mismatch between the values of collectivism and behaviour at work: a response to which could be a shift in values to be more consistent with behaviour. Trade unionisation has fallen, and through legislative programmes such as privatisation and the sale of council houses to individual tenants, not only has the desirability of collective control of the economy been increasingly questioned, but the *experience* of private, as opposed to common, ownership has been extended to a greater proportion of the population. This is exemplified by the fact that privatisation seen in the early 1980s as a controversial and radical policy is now often viewed with equanimity by the

electorate[1]. Whereas once trade union leaders could count on support from their members for strike calls even when the issue in dispute affected another group of workers (reflecting the value of the collective as an end in itself), the 1980s increasingly saw union leaders not obeyed, with individual workers feeling no compunction in crossing picket lines and not supporting workers outside their own situation. The major exception to this has been the public sector, with its turbulent record of strike activity during the 1980s, reflecting, perhaps its vunerability in a climate in which government determined to rein back public provision, as well as the greater collectivistic values associated with those whose career has been in collective provision.

In many ways an increasing tendency to favour individualistic values over those of collectivism[2] can be characterised as a paradigm shift (Kuhn (1962)). One of the conditions which Kuhn described as being necessary for a paradigm shift to take place as being a perceived failure of the old paradigm to deal with current problems.

"Nature itself must undermine professional security by making

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[1] with the exception of certain enterprises, such as the water companies.

[2]such an increased propensity is not without its sticking points: witness the continuing support for the National Health Service in public opinion polls.

prior achievements seem problematic." (Kuhn (1962), p168)

The new paradigm, against collectivism, may be said to have arisen with the eventual demise of those people associated with it. Annan (1990) has argued that the generation of the British post-war political and intellectual establishment was steeped in a similar set of traditions and assumptions. These were inspired by the failure of laissez-faire policies in the inter-war years and the contrasting economic success of common provision during the second world war and the surge of enthusiasm for social progress brought about by victory as well as the comparative success of the collectivist policies in the 1950s and 1960s. Annan went on to argue that by the late 1970s this generation came to vacate the positions of power: their place was taken by a new generation whose intellectual loyalties to collectivism were less obvious. This view ties in with Planck's (1949) analysis of paradigm shifts: he claimed that a new scientific truth does not triumph by convincing its opponents but because its opponents eventually die, and a new generation grows up that is familiar with it.

2.7a Implications for Organisational Responses

A rise in individualism at the expense of collectivism will tend to give licence to firms to innovate by introducing policies which are predicated on a greater individualism, in the belief

that new values will be more tolerant of such policies than was the case in the past. Incentive payment systems, representing an erosion of collective bargaining and a greater requirement for active individual decision-making (whether atomistically or in the context of a group) are particularly consistent with such value change. Indeed, this thesis argues that prevailing individualism is a precondition for incentive pay systems to be successful in motivating effort among employees.

2.8 Conclusion

We have illustrated in this chapter that the background to the rise in the incidence of incentive pay policies is one of significant change in British industrial relations. Moreover, the pressure on organisational responses which can be discerned from this picture of flux seems to be supportive of policies such as incentive pay playing a growing role in employment relationships. How long-lasting the presence of these conditions will be is a question which remains, and if there *is* a causality between industrial relations change and the incidence of incentive pay, the answer to the question will dictate the longevity of this proliferation. Having laid out the context behind them, it is to models of the functioning of incentive pay which we now turn.

SECTION II THEORY

CHAPTER THREE- THEORETICAL APPROACHES TO INCENTIVE PAY

3.1 Introduction

Incentive payment systems are not the direct fruit of academic analysis. Forms of incentive pay, such as sharecropping in which agricultural labourers receive a fraction of the harvest as payment for their work, have operated long before formal research suggested them. The economist Alfred Marshall (1906) conceded that the theoretical case for incentive pay, when it came to be made, represented a formalization of existing practices. Yet incentive pay is an area which has been subject to a great deal of academic theorizing: economists and psychologists in particular have attempted to construct frameworks for analysis in which the underlying conventional wisdom of incentive pay (Jevons (1983) called it an "apparently obvious invention") could be subjected to rigorous investigation which would lead to hypotheses which went beyond the immediately intuitive.

That incentive pay has attracted the interest of academic theorists is not surprising. Economics, concerned with the efficient allocation of factors of production, could not ignore for long how labour is remunerated most effectively, given that it accounts for at least 70 per cent of the total costs of the typical firm (Blinder (1990), p.2). Incentive pay falls clearly within the ambit of psychologists too: motivation is one of the key issues addressed by that

discipline. The theoretical frameworks which have resulted have tended to serve the narrower focuses of each discipline rather than mine the overlap of interest: economics, in recent years, has stressed an external contractual framework with the optimal design of the contract to be determined; psychology has paid attention to the *internal* evaluations and judgements which spur productive activity. As Nalbantian (1987, p8) has pointed out, "the research cited in these two disciplines has proceeded independently; for the most part there has been little cross referencing involved, and few attempts to provide a synthesis of research findings".

In the two following chapters we argue that it is possible to regard economic and psychological frameworks as complementary rather than competing or incommensurable. In particular we show that opening up the economists' 'black box' of causality to psychological insights can increase the confidence we can have in its prescriptions. Thus the internal and the external *can* be synthesised.

One test of successful theorising is predictive and explanatory performance; its reward to influence practice through prescriptive implications. The predictive success of both economic and psychological models of incentive pay has been present but limited. We propose means of improving predictive power and deriving prescriptions which are lent confidence by having survived empirical testing.

CHAPTER FOUR- THE CONTRIBUTION OF ECONOMICS

4.1 Introduction

Economists have been leading advocates of incentive-based payment systems. Both Marshall (1906) and Keynes (1928) issued exhortations to firms to introduce pay for performance structures. Such prescriptions were, and continue to be, advanced on theoretical grounds. Indeed the neo-classical economics approach to payment systems offers a very clear organizing framework from which prescriptions and predictions are easily derived. Recent attention in economics has concentrated on designing an optimal *contractual structure* for pay, based on an assumption that rational actors will respond to the structure in a predictable way.

Econometric evidence on the effects of incentive contracts however, is difficult to interpret. While results are broadly consistent with those hypothesised, superior performance which is on the face of it, associated with incentive pay, may be determined by other factors such as superior management which may be correlated with the incidence of incentive pay systems.

We therefore argue that the predictive power of economic models can be investigated with greater rigour by isolating the role of the contract-design from other determinants of performance. This can be achieved by specifying and testing a theory of *how* a contractual structure motivates individuals.

Supplying such a theory of motivation calls for opening up the economists' black box of causality to insights from psychology.

4.2 Economics and Contracts

Assume that firms in an economy are characterised by a production function in which output is a function of effort, supplied by employees in return for pay. Effort, in this context, refers to the cognitive state under the control of agents which is expected to result in behaviour which contributes to the firm's productivity. Thus behavioral consequences of effort include, *inter alia*, working intensively, maintaining high quality output, and reducing waste.

Assume also that employees maximise a utility function which consists of pay and leisure (the reciprocal of effort). Firms seek to maximise effort and minimise pay, while employees seek to maximise pay and minimise effort. The payment system is, then, a *contract*[1] which joins the self-interest of firms and employees. An economics approach to the analysis of the payment system is to determine the optimal design of the contract. To do so, two questions must be answered: what is contracted over? and who are the parties to the contract? The answers to both questions are shaped by the monitoring costs

[1] Contract refers broadly to agreements and understandings between workers and firms, and not simply to contracts in the legalistic sense.

incurred in making the contracts deliverable.

4.3 What is contracted over?

From the above, it would seem apparent that the optimal employment contract would be over effort and pay, since these are the two quantities which are in the objective functions of both firms and employees.

However, under our definition effort is an internal cognitive state. It cannot therefore be measured objectively. Subjective measurements (self-reports of effort supplied) are not acceptable substitutes in a contract, because they cannot be verified. That is say, monitoring costs are infinite.

If the firm's production function is known, however, the effort input of employees will have a predictable relationship with output. If follows that effort may be inferred from observed output levels: if no production took place it would be clear that no effort had been supplied. More generally, if there is a known and stable relationship between effort and some particular performance, measuring that performance and including it in the employment contract is quite as efficient a structure as rewarding effort directly. Typically, then, *performance* will form the basis of an efficient contract.

For the other component there would seem to be no major obstacles to money being part of the employment contract. It

is a commodity which is meaningful both to firm and employee, and hence attracts no monitoring costs.

An efficient employment contract, therefore, will be over performance and money, according to the above assumptions.

4.4 Who is the contract with?

Since it is firms and individuals who determine their own behaviour according to their respective objective functions, it would seem apparent that contracts should be concluded between the two, involving money for performance. However, modern production processes can make individual performace difficult to monitor, and therefore individual pay for performance contracts costly to administer.

4.4a Individuals

Many pay for individual performance contracts exist in practice, including forms such as promoting high performing individuals and piece-rate systems. Higher-ranking jobs in organisations typically carry higher salaries. By basing entry to such jobs on contribution rather than, say age or tenure, it provides a means of trying pay to individual performance, and so to make for an efficient contract. Hence the more meritocratic the firm the more effort will be

supplied by its employees.[2]

Piece-rates which include no fixed element in pay are perhaps the oldest and most direct means of tying pay to individual performance.

While individual pay for performance contracts are common, their extent may be circumscribed by the monitoring costs incurred in operating such contracts. Typically modern production processes dictate a production function for the firm which is non-separable into component functions for individual employees. With team production it is difficult to define, still less to monitor, each individual's contribution to the output of co-operating inputs. In such circumstances it may be efficient to enter into a contract with the *team* rather than individuals, on the basis of pay for performance.

4.4b Teams

If teams behave in a similar way to individuals faced with a pay for performance contract, contracting with teams is efficient for the previous reasons. Contracting with teams,

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[2]Efficiency wage theorists (eg Akerlof & Yellen (1982)) argue that there is a second way in which effort is increased by operating a pay-for-performance contract. Assuming that available workers are heterogeneous in the degree of effort which they are capable of supplying, individuals who can supply high levels of effort will be drawn to firms who, by operating a pay-for-performance system, fully reward them for the effort which they supply. Hence such firms could cream the most capable members of the labour force. Lazear (1986) confirms empirically that a separating equilibrium exists whereby high quality workers choose to work for firms which operate performance-related pay, and low quality workers choose firms which pay a fixed wage.

however, begs the question of whether they are capable of *delivering* optimal effort. Economists disagree on this question. Property rights economists such as Jensen & Meckling (1979) stress the potential for free-riding by participants in a pay-for-team performance contract. The team will be composed of individuals who determine their behaviour individually to maximise their *individual* utility (a function of pay and leisure).

Samuelson (1977) demonstrates that if a team of *n* workers each receives a fraction 1/n of the output of the team, then each individual will receive 1/n of the marginal product of his own effort. Assuming that his preference for leisure is unchanged, each worker will rationally substitute leisure for effort until his marginal rate of substitution between income and leisure is unity. Since this same incentive applies to each team member, the *aggregate* effort of the team is suboptimal. Team-related pay encourages workers to shirk (ie take leisure on the job). This result corresponds to the Nash equilibrium in a Prisoner's Dilemma model. For example, for two team workers, 1 and 2, who have the choice of working hard (H) or shirking (S), a payoff matrix might be:

Table 4.1

Team Performance Contract: The Prisoner's Dilemma

		Worker 1	
		H	S
Worker 2	H	(2, 2)	(6, -4)
	S	(-4, 6)	(0, 0)

It is always in the interest of each individual worker to shirk, regardless of the behaviour of other team members. If Worker 1 works hard, then Worker 2 can obtain a payoff of 6 by shirking, but only 2 by working hard; if Worker 1 shirks, then Worker 2's payoff is 0 to shirking, which is higher than the -4 payoff he would obtain if he worked hard. Each Worker will rationally attempt to free-ride on his colleague's efforts by shirking. Due to free-riding, then, it is claimed that a pay contract which delivers *optimal effort* cannot be concluded with a team.

Alchian & Demsetz (1972) argue that this fact provides the *raison d'être* of the capitalist firm. Since efficient contracts cannot be made with teams, the effectiveness of the pay contract made by the firm will depend on its ability to monitor individual performance contracts most efficiently. This requires a specialised 'central monitor' which is motivated to carry out its function efficiently by being entitled to receive the residual output of the production

process (i.e. once other factor payments have been made). The owners of the capitalist firm are the typical central monitor. Team performance related pay such as profit-sharing can transfer some of the rights to the residual from the central monitor workforce, which reduces the incentive for the central monitor to perform its function efficiently. Hence firms should not contract with teams, but rather confine themselves to the most feasible monitoring of individual contracts.

Other economists argue that contracting with teams *can* deliver efficient levels of effort because team members will be free to contract with each other over performance. Team-performance contracting in table 4.1 was modelled as a single-period game. Since employment relationships typically continue over time, however, it will be more appropriate to use a repeated-game model. In these circumstances, team members will have the opportunity to punish their colleagues, should they shirk, by withdrawing their own effort in the next period. Knowing this, players may value the long-run payoff expected from following a co-operative strategy more than the short-run payoff to be expected from breaking ranks and pursuing a strategy of shirking. Hence, with common knowledge of each other's motives, team-performance contracting may yield an efficient level of effort for the firm and still be consistent with rational behaviour on the part of individual employees.

Moreover, Cable & Fitzroy (1980) maintain that contracts

within teams brings into play horizontal monitoring by team-members of each other, backed with sanctions such as social ostracisation. This may be a less costly form of individual performance monitoring than the central monitor could devise, and result in team-performance contracting being a more efficient structure than contracting with individuals. Kanter (1989, p264) reports that at the Lincoln Electric Company, where a team performance bonus results in pay that is twice the average factory wage "Peer pressure can be so high that the first two years of employment are called 'purgatory'."

What can be drawn out from the debate is that the question of whether efficient contracts can be made with teams rests on an assessment of whether teams can behave in a similar way to an individual. This in turn depends on how costly it is for team members to make and monitor contracts with each other. Since the costs of horizontal monitoring are likely to increase with the size of the team (it is easy to vet one's partner's performance; more difficult to do so for twenty individuals) and the efficacy of applying social sanctions personally to decline with size, team size is an important factor which governs the answer to the question. Differences among economists may be said to be focused on the team size sufficient to allow efficient team contracting: Jensen & Meckling (1979) and Alchian & Demsetz (1972) are sceptical that anything but the smallest team size can be contracted with efficiently, Cable & Fitzroy (1980) are confident that even large groups will structure themselves to be effective

parties to a contract. The size of teams consistent with efficient levels of effort being supplied thus becomes an empirical question.

4.5 Risk Issues

We have assumed so far a predictable relationship between effort and the monitored performance of either the individual or team. In practice, however, performance will be influenced by factors outside the control of parties to the contract. These factors may be impossible or costly to monitor in order to take account of in the contract. As a result actual performance-related pay will typically entail a stochastic element. If employees are more risk-averse than the firm which employs them (because of their inferior access to capital markets, for example), then a pay contract which shares the stochastic element equally between workers and the firm will not be efficient. Workers would supply the same effort at a lower rate of pay if they were protected from the unpredictable variability in their performance. This introduces an essential trade off in the optimal structure of the contract to maximise effort relative to pay. A fixed wage will provide the work force with incentives to shirk, since marginal effort is not rewarded (and marginal reductions in effort go unpunished). However a wage which varies beyond the control of the employee requires a premium to compensate him for the risk. What this means in practice is that the typical efficient contract will include both a fixed and performance-

contingent element which reflect the relative importance of employee risk-aversion and prospective losses from shirking. It is a *second-best* solution (Lipsey and Lancaster (1956)), optimal given imperfect knowledge of future states of the world.

It also means that a pay contract which comprises a fixed wage only will be a special case, optimal only where employee risk aversion is infinite. Hence the clear prescription of economics is that for optimal effort to be generated in the firm a contractual structure should be laid down in which pay is linked to performance to some extent. The stronger the link, the greater the effort supplied. The more direct the link, the greater will be effort supplied, although it is left to empirical analysis to indicate what typically will be the maximum team size for team-performance based pay to provide for significantly higher effort than would be forthcoming in its absence.

In the contract theory approach concern is focused on the optimal *design* of the contract which, applied to rational actors, will result in optimal effort being supplied. No explicit consideration is given to *how* a pay contract can bring about effort. The motivational and productivity effects are conceptual presumptions the causality of which is subsumed into a 'black box' into which economists do not inquire.

4.6 Econometric Evidence

The 'black box' treatment of *how* incentive pay contracts bring about higher effort presents methodological difficulties in testing rigorously the positive hypothesis that incentive pay *does* increase effort at work. It is difficult, in practice, to isolate the effects of the payment system on the effort-correlate which is hypothesised to be influenced by it.

Econometric studies typically assess the performance of a particular system (i.e. contract design) by reference to its measurable outputs. Thus, for example, the labour productivity (Kruse (1988), Estrin & Wilson (1986)), profitability (Fitzroy & Kraft (1987), Hanson & Watson (1990)) or share price performance (Richardson & Nejad (1986)) of particular firms are correlated with the payment-system which they operate.

Three important factors undercut the contribution of econometric evidence. The first is that the sample of firms with pay-for-performance systems may be self-selecting: 'better' firms may introduce profit-sharing, so that the causality of an apparent relationship between profit-sharing and productivity may be bogus. The second source of ambiguity in economic empirical studies is that many of them examine the productivity effects of employee ownership as part of the debate on the co-operative organisational form which has taken place in recent years (cf Bradley & Gelb (1983), Defourny,

Estrin & Jones (1985)). The effects of co-operative ownership are hypothesised to flow from both incentive effects and *participation* effects, making it difficult to isolate the former, our concern here. A third methodological issue is concerned with the behaviourial assumptions which underlie the economics approach, namely that actors faced with a certain incentive structure *will* maximise rationally their individual self interest. Econometric studies cannot assess the validity of both the underlying assumptions of economic rationality and the hypothesis that a particular contract design will bring about a particular output.

However, what empirical evidence there is tends at least not to reject the conceptual presumption that incentive pay contracts raise effort and thereby performance. The confidence that can be placed in this evidence, though, is undercut by the methodological difficulties of the approach and by the patchiness of the results of what is still a surprisingly small body of econometric studies.

Weitzman & Kruse (1990) pointed out the limited number of econometric studies carried out: they found in the published literature only seven econometric studies of the effects of profit-sharing in *capitalist* firms (i.e. excluding co-operatives). Of this body of evidence (the first seven reported in table 4.2) Weitzman & Kruse argued that while no single study could be regarded as constituting convincing evidence for a causal link between profit-sharing and

performance, taken together the broad consistency of direction of the results did lend support to economics inspired incentive contracts.

However, Guzzo *et al* (1985, p.114) summarised the evidence as demonstrating a large, positive mean association between financial incentives and productivity but with an association so variable that it was not significantly different from zero. They commented:

> *"In some of the experiments financial incentives had a pronounced positive effect on the productivity of employees in an organisation, but in other cases there was evidence of negligible or unwanted negative effects."*

The results of these and other empirical studies are summarised in table 4.2, along with the dependent variable used and the country in which the investigation was performed. Table 4.2 shows that what evidence there is surrounding the economics approach to the analysis of payment systems suggests that pay-for-performance structures, of a variety of forms, tend to be associated with high performance relative to other firms. This conclusion can be drawn more robustly from the experience of US firms than the UK practitioners, according to the evidence surveyed.

Table 4.2: Incentive Pay: Econometric Evidence

Study	Country	Pay System[2]	Productivity Measure	Significant at 95?%
Cable & Fitzroy (1980)	West Germany	PS, ESOP	Value-added	No
Fitzroy & Kraft (1986, 1987)	West Germany	PS	Profits/total factor productivity	Yes
Wadhwani & Wall (1988)	UK	PS	Real Sales	No
Mitchell Lewin & Lawler(1989)	US	PS	Sales per employee Return on assets Return on investments	Yes
Shepard (1986)	US	PS	Value added	Yes
Florkowski (1988)	US	PS	Value added	No
Kruse (1988)	US	PS	Revenue per employee	Yes
Yukl & Lathan (1975)	US	Individual incentives	Output	Yes
Estrin & Wilson (1986)	UK	PS	Labour Productivity	No
Richardson & Nejad (1986)	UK	PS	Share Price	No
Hanson & Watson (1990)	UK	PS	Return on sales Return on equity Increase in sales	Yes

Key:
PS = Profit Sharing
ESOP = Employee Share Ownership Programme

However, because of the methodological problems discussed, we are unable to conclude firmly that incentive-pay structures do yield high performance. As Richardson & Nejad (1986, p24) observe of their own study (reported in table 4.2)

> *"the use of financial participation might be an excellent index of improved management, but not the sole cause, or even an important contributor to improved performance."*

4.7 Conclusion: Towards an Interdisciplinary Approach

The new economics of contracts offers a framework for the analysis of payment systems which is exceptionally clear and parsimonious. However, empirical results are not so robust as to obviate attempts to improve its predictive power. Adopting an interdisciplinary approach to incentive pay can go some way towards achieving this, we argue. Neo-classical economics links inputs (labour) to outputs (productivity) through an assumed, but unspecified, 'black box' of causality. The process by which a certain payment structure brings about a given level of performance from given inputs is not investigated. Thus a finding that firms with incentive-based payment systems are associated with high levels of productivity is taken as empirical confirmation of the effects of the contractual structure. Leibenstein (1966) points out, however, that "there is more to the determination of output than the obviously observable inputs." He specifies the nature of firms' management, and the environment in which they operate as shaping performance as well as structural factors including labour contracts. As evidence of this, Liebenstein

points to the wide variation in output in practice, for similar amounts of capital and labour and for similar techniques.

Allowing this introduces ambiguity over the interpretation of the empirical evidence since superior performance by incentive-pay-firms may reflect the contribution of superior management rather than follow from the contractual structure. Hence empirical investigation of the effects of pay-for-performance must isolate that factor from others *within* the 'black box' which may be hypothesised as the process by which a certain contractual structure brings about a certain level of performance. As Williamson (1964, p7) points out,

> *"if economists are to respond to this challenge and to specifically inquire into the process by which firms are operated, obviously there is a need for fundamental organisational insights."*

If a complementary model of motivation were specified alongside an efficient contract model, the power of incentive pay *per se* to increase effort could be demonstrated if both the effects and the process hypothesised to cause them were consistent with empirical evidence.

Since motivation is a field of inquiry much investigated in psychology, the two disciplines of economics and social psychology may be profitably treated in a complementary way to build a model which is more robust to empirical testing. The greater the robustness of the incentive-pay model, the more confidence we can have in prescriptions derived from it.

Accordingly chapter five assesses the contribution of psychology to an interdisciplinary model of incentive-based payment systems.

CHAPTER FIVE - THE CONTRIBUTION OF PSYCHOLOGY

5.1 Introduction

To build an interdisciplinary approach to the analysis of incentive pay we seek to specify a model of *how* incentive pay motivates effort. This should complement, rather than conflict with, the contract theory approach. In addition, to provide the means to generate confidence in its implications, the model should be empirically testable.

5.2 Motivation

Psychologists have traditionally been the academic analysts of motivation, which we define, after Jones (1955, p*vii*) as that which, in responses to antecedent conditions "starts, energizes, sustains, directs and stops" behaviour in an individual. Under a strict behaviouristic interpretation motivation is a hypothetical construct (albeit a potentially useful one): a definition given in terms of antecedent conditions and consequent behaviour. A non-behaviourist could interpret motivation as being an internal cognitive state which is determined by antecedent conditions and which itself gives rise to behaviour.

Theories of motivation have their roots in the principles of hedonism. In claiming that all human actions are motivated by the desire to seek pleasure and avoid pain, Hobbes (1651)

proposed, in effect, a theory of psychological hedonism. In so doing Hobbes turned what was previously a normative ethical principle into a positive theory of motivation. A principal shortcoming of hedonism, however, is that it does not specify what *constitutes* pleasure and pain. Thus it risks being tautological: behaviour is defined as having pleasurable consequences by the fact that it is carried out. To be useful for our purposes a theory of *how* humans are motivated must be supplemented with a theory of *what* motivates them. In the case of incentive-pay systems money is advanced as a motivator. We must consider, therefore, the grounds for hypothesising that money is a source of motivation for individuals.

5.3 Pay as a Motivator

To think of incentive pay as a motivational device is to assume that pay is something which is typically valued by individuals, and will therefore serve to motivate them. Pay, in other words, is associated with pleasure and not pain.

The assumption that pay is a valued reward may be thought self evident. It is, however, supported by a body of empirical evidence (eg Bradley and Gelb (1983)) and can be shown to be consistent with theoretical traditions. Vroom (1964) has stressed the instrumental role of money in attaining a wide variety of satisfactions. For example, in Maslow's (1954) *Hierarchy of Needs*, which is postulated to represent sources

of motivation of all individuals, pay may be argued to be instrumental in satisfying needs throughout the hierarchy;

Table 5.1
Maslow's Hierarchy of Needs

(v)	Self Actualization
(iv)	Esteem Needs
(iii)	Relationship Needs
(ii)	Safety Needs
(i)	Physiological Needs

In modern society money is, of course, virtually a prerequisite in satisfying the lowest rung of the hierarchy, that of physiological imperatives (food, shelter, clothing). The role of money as a store of value can be instrumental in meeting individuals' safety needs, by providing insurance against unforseen circumstances. Katz and Kahn (1952) argue that pay will motivate individuals at work because in the community at large money brings prestige to its owner and has a positive association with status. In Maslow's hierarchy this can be taken to mean that money satisfies esteem needs. Katz and Kuhn (1952) also argue that higher pay is an aid to social mobility. Thus pay can be regarded as tending to satisfy the need for self actualization.

Maslow argued that once the needs denoted by one level in his hypothesised hierarchy have been largely satisfied, it no

longer acts as a motivator of behaviour. Since the instrumental role of money can be identified with satisfying needs throughout the hierarchy, positing money as a *general* motivator is consistent with Maslow's theory.

However, it is reasonable to concede that pay is *more* instrumental in satisfying lower order satisfactions than those at the top of the hierarchy: Brayfield and Crockett (1955, p417) observe that there are other ways to status in the community than financial affluence. As such, it is possible to maintain that pay is a general motivator whilst allowing that it is subject to diminishing marginal utility. Neither does such an assumption imply that pay is the only reward which can motivate behaviour at work. Our assumption, and the assumption of incentive pay systems, is simply that the representative individual will always prefer more pay to less.

5.4 The Motivational Process

We hypothesise, therefore, that pay is capable of motivating individuals,and now turn to consider *how* people are motivated. In the class of process theories of motivation there are two main traditions, the drive theory and expectancy theory approaches. In this section we provide a brief summary of the central tenets of each.

5.4a Drive Theory

Drive theory was developed in the first half of the twentieth century by psychologists strongly influenced by the experiments of Pavlov and Thorndike which demonstrated that animals' responses which had in the past been accompanied or closely followed by satisfaction were more likely to recur than those followed by discomfort. Thorndike's analysis of trial-and-error learning fashioned the view that historic reinforcement determined an individual's 'drive', and that a multiplicative combination of this concept and force of habit determined individuals' behaviour. The backward-looking orientation of drive theory led Allport (1937) to characterise it as 'the hedonism of the past.'

Hull (1943) specified the key hypothesized relationships of drive theory. Importantly, drive is derived from individuals' *physiological* needs and deprivations (eg hunger). Habit-strength results from previous stimulus-response connections. While the causes of motivated behaviour under drive theory have physiological roots, the resulting behaviour need to be neither cognitive nor selectively instrumental to satisfying the deprivations. Indeed Atkinson (1964) describes drive as being a *general* excitement: a non-selective influence on behaviour.

5.4b Expectancy Theory

Since the publication of Vroom's book *Work and Motivation* in 1964, expectancy theory has been the leading theory of motivation in organizational psychology. It hypothesises that it is the *anticipated* satisfaction of valued goals which brings about behaviour which is perceived by the individual to be instrumental in attaining them. Thus if drive theory is to be characterised as the hedonism of the past, the expectancy theory may be fairly dubbed the hedonism of the future.

Lawler (1973, p45) summarised the theory as stating that "the strength of a tendency to act in a certain way depends on the strength of an expectancy that the act will be followed by a given consequence (or outcome) and on the value or attractiveness of that consequence (or outcome) to the actor." Whilst the popularity of expectancy theory is comparatively recent, it draws on the tradition of an individualistic rational calculus of expected satisfaction determining behaviour which is associated with the British utilitarians.

Since it is the subjective perceptions of consequences which motivates behaviour under expectancy theory, the approach is clearly a *cognitive* view of motivation. In contrast to drive theory, motivated behaviour is both selective and purposive aimed at the attainment of valued goals. This is not to say that expectancy theory brooks no element of reinforcement in determining behaviour. Rather, reinforcement can be

introduced via learning. The difference between this approach and that of drive theory is that reinforcement is not a necessary condition for learning to take place. Finally, as a cognitive theory the expectancy approach is not anchored to physiological needs: psychological factors can determine motivational force.

5.5 Which Approach to Adopt?

Although descriptive properties of human decision processes are claimed by advocates of each theoretical tradition, empirical tests of the predictions from each have failed to confirm either as predictively the more powerful. Atkinson (1964) has claimed that the predictions of each theory have proved similar in almost every empirical circumstance. In the light of this, the choice of theoretical framework should be that which facilitates best the theoretical model which we mean to construct. Using this criterion we find the expectancy approach the more useful. There are three principal reasons for this choice.

The contribution of contract theory surveyed in the previous chapter is predicated on a similar set of methodological assumptions to those of expectancy theory, namely that individuals engage in a rational calculus of their individual self-interest. The congruence of these assumptions assists us in seeking to specify a theory of how incentive pay can motivate effort which is consistent with the economics

approach.

In Chapter Four we defined effort as being a particular class of behaviour whose essential characteristic is that the subject is cognisant of his own behaviour and that the behaviour is purposive towards increasing productivity. Since the subject of our analysis is behaviour which is cognitive and purposive, from the above expectancy theory is more consistent with our analysis than is drive theory.

Finally, expectancy theory has been the dominant school in the theoretical and empirical research of the last twenty-five years, resulting in a pool of findings and applications. For a methodology which includes empirical testing of hypotheses this body of evidence provides for a wider basis for criticism and comparison than is the case for drive-theoretic approaches.

5.6 An Expectancy Theory Approach

Vroom's 1964 book *Work and Motivation* stimulated a flurry of research interest in the expectancy theoretic approach to motivation. Vroom himself, however, drew on a tradition which can be traced back to Bernoulli in the early 18th Century. Vroom's basis postulate that behaviour results from a subjective calculus of expected utility is similar to that applied by Bernoulli to the analysis of gambling. In this century expectancy models can be seen to be in the tradition

of the psychologists Tolman (1932) and Lewin (1938), early advocates of cognitive theories of behaviour who held that individuals' behaviour is governed by expectations concerning future events.

Georgopoulos, Mahoney and Jones (1957) were the most immediate precursors of expectancy theory with their 'path-goal' approach to the motivation for productive performance at work. The path-goal hypothesis stated that "if a worker sees high productivity as a path leading to the attainment of one or more of his personal goals, he will tend to be a high producer. Conversely if he sees low productivity as a path to the achievement of his goals he will tend to be a low producer," (p346). The cognitive, forward-looking, purposive and subjective conceptions of motivated behaviour are all common to expectancy theories.

Vroom hypothesised that the force on an individual to perform a certain act is a monotonically increasing sum of the products of

(i) the subjective expectation, or *expectancy*, that performing the act will result in the attainment of a valued outcome,

and

(ii) the subjectively anticipated satisfaction, or *valence*, associated with that outcome.

Formally, the Force Model is

$$V_j = f \sum_{k=1}^{n} (V_k I_{jk}) \qquad 1$$

where

V_j = the valence of outcome j

I_{jk} = the perceived instrumentality of outcome j for the attainment of outcome k

V_k = valence of outcome *k*

n = the number of outcomes

Vroom supplemented the Force Model with a model of the determination of the valence of a particular outcome. This is conceived as being a monotonically increasing function of the sum of the products of:

(i) the valence of all other outcomes, and

(ii) the perceived instrumentality of the outcome in question for the attainment of these other outcomes.

Symbolically,

$$F_i = \sum_{j=1}^{n} (E_{ij} V_j) \qquad 2$$

where

F_i = the force on the individual to perform act i

E_{ij} = the expectancy that act i will be followed by outcome j

V_j = the valence of outcome j

n = the number of outcomes

The model is explicitly universal in both its applicability and its content. As a model of the forces on the human decision making process it applies to rational individuals at all times and in all situations. Our purpose, however, is to develop a model for a particular inquiry, namely how incentive pay contracts can bring about higher levels of effort than fixed wage contracts. Accordingly we must specify a form of the expectancy model which is suitable for such an analysis and to derive a set of hypotheses which summarises its implications.

To do so we make use of Galbraith & Cummings (1967) synthesis of Vroom's Force and Valence models, and apply it to incentive pay; accordingly effort is the dependent variable, performance the first level outcome, and pay the second level outcome. Thus

$$W = E\ I\ V \qquad 3$$

where

W = effort

E = the expectancy that effort leads to performance

I = the instrumentality of performance for the attainment of pay

V = the valence of pay

Equation 3 states that an individual's effort supplied will be a multiplicative combination of:

(i) the subjective perception that effort will result in

performance

(ii) the subjective perception that performance will be materially rewarded

(iii) the satisfaction anticipated from pay.

In practice, if an individual sees it as being clear that extra effort will bring about more pay, and he expects to derive great satisfaction from that pay, then effort is more likely to be supplied then if the relationship between effort and performance, or performance and rewards is thought to be slight or uncertain. Equally, if prospective pay is very highly valued, but the chances of the employee being able to supply enough effort to attain it are deemed small, the rational individual will supply a low amount of effort.

Porter & Lawler (1968) and Lawler (1970) postulated an expectancy model similar to that of Vroom but which differs in terminology and how the variables are combined. However, as Heneman & Schwab (1972) point out, in the case of only one second level outcome being considered (as is the case in our study of pay) the Vroom and Porter & Lawler models are identical. Although subject to a great deal of empirical investigation and theoretical inquiry, the expectancy theoretic approach to the determination of effort under incentive pay has remained essentially of the form described.

5.7 Expectancy Theory and Economics

In addition to sharing common methodological underpinnings of universality and ahistoricity, based on a conception of man as a maximiser of his individual self interest, the components of expectancy models and of the economic analysis of efficient contracts are analogous.

Expectancy, the perceived relationship between individual effort and measured performance, can be seen to be related to the free-riding issue in efficient contracting: the smaller the link between individual effort and measured performance, the greater is the return to shirking for the individual. A one-to-one link between individual effort and measured performance removes this incentive to shirk. While economics considers the contractual structure, (that is, the *objective* relationship between effort and performance), in determining how much effort is supplied in response to an incentive contract, expectancy theory focuses on the *subjective perception* of the objective relationship. The essential difference between the two approaches is their standpoint: economics taking the objective view, and psychology the subjective.

Similarly, instrumentality, the perceived relationship between measured performance and pay, mirrors the extent of performance-related pay in the employment contract. Risk issues aside, any departure from 100 per cent performance-

related pay in the contract is claimed, in the efficient contracts approach, to result in a sub-optimal level of effort being supplied. Expectancy theory stresses the subjective perception of the performance-pay relationship as being the determinant of the decision by an individual to supply effort.

Table 5.2 summarises these correspondences

Table 5.2

Correspondence Between Economic and Social Psychological Approaches

Economics	**Social Psychology**
Effort	Effort
Potential for free-riding	Expectancy
Extent of performance-related pay in contract	Instrumentality
Magnitude of incentive element	Valence

Since the four variables of the expectancy model are open to measurement by psychometric means, the hypothesized motivational process is testable. If the four variables can be shown empirically to be linked in the form hypothesised by equation *3*, and it can be demonstrated that incentive pay, that is the objective contractual structure, affects expectancy and instrumentality perceptions, we can be confident that incentive pay *does* bring about higher effort levels among employees, as presumed conceptually by neo-

classical economics. Moreover the empirical demonstration will have short-circuited the methodological difficulties of basing tests purely on econometric analyses (the possibility that unspecified covariates of the incidence of incentive pay determine any revealed superior performance of companies operating incentive contracts).

5.8 Conclusion

In expectancy theory social psychology provides a hypothesized motivational process which is not inconsistent with an economic, contract-based model of the effects of incentive pay. As such it provides an alternative means of testing the hypothesized effects of incentive pay and avoiding methodological difficulties incurred in econometric testing. If psychometric tests demonstrates the robustness of the expectancy model, and show that its key variables are governed by the contractual arrangements which subjects face, we can have confidence in predicting that efficient contracts *qua* contracts will cause high levels of effort to be supplied, as well as confidence in the prescriptions derived from both models.

However, one aspect of the compatibility of economic and psychological approaches to incentive pay is, we argue, a source of limitation of the predictive power of each. In Chapter Six we argue that the theory of human rationality

implicit in both approaches is very particular and frequently departed from in practice. People are often unable or unwilling to engage in the calculus of their individual utility which is assumed by the models which we have discussed. Thus we contend that the ambit of these models should be limited to where their underlying assumptions are borne out. This will have the effect of rendering the models more powerful as predictive tools since their domain will be properly respected.

CHAPTER SIX - LIMITATIONS OF RATIONAL ECONOMIC MAN: OPTIMIZATION

6.1 Introduction

The economic and social psychological approaches to the analysis of incentive pay share a broadly similar set of underlying assumptions. Although rarely stated explicitly they include a conception of man as being engaged in the maximisation of his own, individualistic utility. The models founded on these assumptions are presented as being ahistoric and universal. According to Becker (1976, p5) the decision-making preferences "are assumed not to change substantially over time, nor to be very different between wealthy and poor persons, or even between persons in different societies and cultures."

This set of methodological assumptions has been characterised as that of *rational economic man* by some writers[1] (eg Hollis and Nell (1975), and as the assumptions of neo-classical rationality by others (Etzioni (1988)). More commonly in the literature of models founded on them, this set of assumptions is referred to as simply *rationality*: as Leibenstein (1976,

[1]This is not to say that this conception of rationality is adopted by every theorist. Rather we argue that it is the dominance of these assumptions which is the basis of our characterisation. That this is so is supported by the experience of Scitovsky (1976) in investigating the rationality assumptions of economics: "economists are deeply divided into the Establishment and its radical-left critics, but they were like a harmonious and happy family in their unanimous hostility to my ideas".

p76) observes, "economists use the word *rationality* as a synonym for maximisation or optimisation."

However, this is not the only possible conception of rationality, and more maverick writers in both Economics and Psychology are recognising the limitations of *rational economic man* assumptions for predictively powerful theorising. As Etzioni (1988, p*ix*) observes, perhaps a little prematurely, "we are now in the middle of a paradigmic struggle. Challenged is the entrenched utilitarian, rationalistic neo-classical paradigm which is applied not merely to the economy but also, increasingly, to the full array of social relations."

6.2 The Methodology of Rationality

The assumptions subsumed under *rational economic man* have no objective validity. They are *analytic* truths: assumed true by convention to provide a foundation for theory building. They have no factual content: how can we know that economic behaviour is motivated by the desire to maximise the satisfaction on one's desires?

The assumptions *can* be regarded as comprising a normative view of how behaviour ought to be: what Luce and Raiffa (1958) call a rationality to which we should *aspire*. More often, however, models built on the assumptions (such as those considered in chapters four and five) purport to be positive theories of

behaviour. In this case, while simplifying assumptions are always necessary if manageable theories are to be constructed, it is important not to lose sight of the fact that such models apply only where the assumptions are met. Prescriptions derived from theoretical models, too, are valid as long as the assumptions are accurate. Accordingly the *boundary conditions* of theories, the domain in which their predictions and prescriptions are meaningful, are an important, if frequently overlooked, area of investigation. In the case of incentive pay, the insights offered by economics and expectancy theory are meaningful as long as the underlying assumptions of economic rationality hold: where they do not, there is no theoretical basis for expecting the models' implications to hold.

6.3 Criticisms of Rational Economic Man

A growing body of theory and evidence is suggesting that human decision-making does not approximate to that assumed under *rational economic man* at all times and in all places. Two sets of arguments contribute to this critique of the universality of rational economic man.

First, the process of optimization which rational economic man assumes can be shown to be beyond the cognitive powers of individuals. On behavioral grounds Simon (1957) has advanced other models of decision-making as being more accurate than strict optimization. Leibenstein (1976, p73) observed that

"outside circles of economists...individuals normally dislike tight calculation activity".

Secondly, the role of values, which guide people's conception of appropriate behaviour, influences to what extent they are calculative and individualistic, as assumed in rational economic man, or less calculative and more concerned with the welfare of others. The economist Solow (1980) has questioned the limits of economic models in this way, asserting that labour markets are not smoothly self-clearing because workers pay attention to "principles of appropriate behaviour whose source is not entirely individualistic", (p3). To the extent that values consistent with rational economic man vary across people and over time, the applicability of models based on the assumptions which comprise it will be defined by this consistency as a boundary condition.

In this chapter we consider the implications of the optimization postulate, and in Chapter Seven address the role of values as a boundary condition in payment systems.

6.4 The Optimization Postulate

Simon (1957) argued that the cognitive powers of reasoning required to carry out the optimization assumed under rational economic man are not within the capability of man generally. In most real-world situations the individual is faced with a complex set of choices and contingencies, with many thousands

of variables and constraints to negotiate. It can be easily demonstrated that optimization over even a modest subset of these variables involves complicated mathematics. It can equally be demonstrated that the typical human has difficulty in multiplying even two large numbers without the aid of pencil and paper.

On behavioral grounds Simon (1956) advanced a theory of 'satisficing' which he argued characterises human decision-making better than optimization. Faced with a situation in which genuine optima cannot be computed within feasible limits of effort, the decision maker will look for a *satisfactory* rather than an *optimal* alternative.[2]

A closely allied model of non-optimizing decision making is that of bounded rationality. Bounded rationality stems from both the computational limits of the decision-maker, and his limited knowledge of available alternatives and how they relate to each other. Accordingly, the agent is held to make choices over a narrow range of choices at any one time, which may be inconsistent with choices made at other times, and which do not reflect all alternatives.

To be meaningful, optimization relies on the assumption that

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[2]The immediate objection to such a theory is that it can always be broken down to reveal the operation of an optimizing process by, for example, taking into account information gathering costs in determining which option is chosen. Since, however, this calculation would be quite as complicated as straightforward optimization it can be argued that satisficing does constitute a genuine breach of the optimization principle.

human decision-making is transitive. That is, the preference orderings which individuals attach to outcomes are consistent. If X is preferred to Y on one occasion, but Y is chosen over X on another it is impossible to say which outcome represents optimal utility. The possibility that inconsistent choices characterise human decision-making is therefore a challenge to the principle of optimization on which rational economic man is founded.

Liddell and Solomon (1977), in placing expectancy models in the class of subjective expected utility (SEU) models of decision-making, invoked the decision theory literature to demonstrate that intransitivities are endemic to actual choices made, although the extent varies. Other empirical evidence supports criticism which argues that optimization is not an accurate representation of human decision-making. Simon (1987, p244) showed that "it is easier to reconcile a satisficing than an optimizing theory of economic decision making with what is known empirically of actual choice behaviour." Feldman *et al.* (1976), in a series of experimental tests of the postulates of expectancy theory, reported that subjects' behaviour was typically non-optimizing in the context of outcomes presented to them. Mitchell (1982), in a survey of expectancy tests, considered that expectancy theory, with its requirement that expectancies and instrumentalities are estimated, multiplied together and their products summed, over-intellectualises the decision-making process, and that the empirical results reflect these

inadequacies.

6.5 Implications for models of incentive pay

The strict assumption of optimization, given that it does not accurately reflect individual decision-making, reduces, we hypothesise, the predictive power of models which incorporate it when they are applied in practice. Accordingly a less rigid assumption may improve the predictive accuracy of hypotheses drawn from models of incentive pay.

If predictive power is the criterion for establishing the usefulness of a theoretical model, it is at least possible that replacing the economic rationality assumption of utility maximisation with a less rigid replacement may improve the empirical success of the economic and expectancy models. In particular the specification of a strict multiplicative expectancy model, such as that of equation *3* (see Chapter Five) may be relaxed to allow other, less computationally taxing, combinations of the variables to be made in practice. Also, since behaviourial choices may be made on consideration of only a subset of relevant variables, the strict inclusion of all the variables specified may be relaxed if evidence suggests that certain of them are ignored or overlooked in practice.

Departing from the optimization assumption involves allowing for different specifications of the structure of the models of

incentive pay which are provided by economics and expectancy theory. This is in keeping with Popper (1959): in the last analysis a choice between the alternative assumptions will be made whether departing from rational economic man improves the predictive accuracy and effectiveness of the incentive-pay models.

CHAPTER SEVEN - THE LIMITS OF RATIONAL ECONOMIC MAN: VALUES

7.1 Introduction

Leibenstein's (1976) observation that individuals dislike tight calculation activity is a crucial departure from *rational economic man* in that it introduces decision-making techniques as a choice variable.

Presented with a given set of alternatives, different people may employ different means of deciding which choices to make. Some may calculate tightly their individual payoffs, others may be less precise and more concerned about the general welfare. The behaviour which results will be heavily dependent on the type of decision-making system used to choose between alternatives. In the Prisoner's Dilemma framework, for example, if some individuals take into account the general interest in their decision-making, predicting their choices by assuming that they behave as rational egoists will prove a model of their behaviour which has poor predictive power.

7.2 Values and decision-making

For some people taking account purely of one's own self-interest is unacceptable. As Argyris (1964, p24) observes "society may have norms that tend to prescribe how much self awareness is permissable". Society's norms shaping individuals' *values* affect the way in which they choose their

behaviours. After Schwartz and Bilsky (1987), values refer to concepts of desirable behaviours which transcend specific situations and guide the selection or evaluation of behaviour. Values differ from the preferences of *rational economic man* because they concern behaviour as well as outcomes. They represent standards which individuals must live up to: doing so could even mean forgoing opportunities for satisfaction.

People's values, governing their decision-making, can be consistent with the assumed calculative individualism of rational economic man, or they can depart from it. We argue that values affect behaviour in that a particular type of behaviour is more likely to be made the more consistent it is with the individual's value set. Behaviour which violates passionately held values will be less likely to be observed than behaviour which is consistent with them. Yet as Feather (1982, p265) points out "textbooks in social psychology have had little to say about values".

The sources of personal values may be thought of as being twofold. A set of values may be held to be intuitively present in an individual, acquired either at birth or during the person's early development. The similarity between the conceptions of values and personal morality permit this to be seen as akin to the intuitivist conception of morality. The second source of personal values, which can be regarded as either an alternative to or augmentation of the first, is to conceive of them as being socially given and hence, in the

individual, internalised conceptions of social standards and norms taken from the outside environment each a person faces. This ties in closely with Freud's view that the human superego, man's moral conscience, comprises the internalisation of *societal* norms. Such a view can also be seen as implicit in Weber's writings, with the current teachings of religious institutions moulding individuals' *value rationality*.

7.3 Values affect behaviour

Two principal theoretic routes describe how values affect behaviour. Bandura (1986) has summarised the role of values in behaviour by conceiving of the individual as being motivated by his expected internal reaction to this actions, with the internal reaction being positive insofar as the action is consistent with his value set. Values act, then, as an internal evaluative screening device for possible behaviours. A second conduit for the ability of values to affect behaviour is the 'social commitments' view adopted by some sociologists (Goffman (1961), Stebbins (1971)). In this context the argument can be taken to imply that from a person's previous behaviour society at large imputes certain principles or values which it expects to see adhered to. Hence past behaviour creates expectations which future behaviour must meet if the person is not to risk social penalization. These two approaches are synthesised in Rokeach's (1973, p47) assertion that behaviour is made with

reference to values in order "to make it possible to regard ourselves and to be regarded by others as having satisfied socially and institutionally originating definitions of morality and competence."

Weber (1930) held that the lack of conformity between the value-system which was dominant in medieval Europe, and the behaviour inherent in capitalist organisations was the principal obstacle to the development of capitalism. Through the prohibition of usury the Christian Churches inculcated a set of values which amounted to avoiding the calculation of gains from loans reflecting an attitude to enterprise which held that individuals should not seek for personal gain but to make a living. The rise of protestantism in Northern Europe, Weber wrote, imparted a set of values which departed radically from the traditionalist outlook. Stressing the importance of personal industry, yet deprecating consumption, puritanism promoted the desire to seek profit for its own sake. This emergence of a set of values which Robertson (1933) has called economic individualism brought into conformity the values of certain peoples with those necessary for a capitalist take off.

The historian R.H. Tawney (1926), while rejecting Weber's view of the role of Protestantism, agreed with the proposition that an incompatible set of values could prevent the behaviour implied in capitalism. He differed from Weber in regarding the accessory accommodating change in values as the

contraction of the territory within which the writ of religion was conceived to run.

That values compatible with certain types of behaviour are necessary to be present for that behaviour to take place need not be taken to imply that values are always most appropriately formed. At the heart of the Marxist notion of false consciousness is the view that revolutionary behaviour demands as a precondition that workers are possessed of a revolutionary consciousness. That such a value set is not typically held means that revolutionary behaviour does not arise: as Moorhouse and Chamberlain (1974, p388) lament, "the masses will remain entrapped by economism," the value-set of false consciousness undercuts their position.

We have suggested in previous chapters that the rational economic man assumptions which underlie models of the effects of incentive payment systems assume a view of human nature which is individualistic, calculative and maximising. As particular means to ends these assumptions correspond to certain of the possible values which an individual may have, under our conception. It
follows from this that the behaviour will result as expected from such models to the extent that the values of the individuals in practice are consistent with those implied in the models' assumptions. The closer the actual values conform to those assumed in the models, (for example the more calculative the individual), and the greater is the intensity

with which the values are held, the more confident we can be in expecting the behaviour predicted by the models to result in practice.

7.4 Values and universality

Cross cultural research has demonstrated that the compatibility of people's value sets with those implied by models of incentive pay varies substantially. Indeed the value set implied (calculative individualism), forms a nexus by which different nations can be classified.

Such distinctions hark back to Tonnies' (1922) division of the individualist dimension into *Gemeinschaft* (a collectivistic orientation) and *Gesellschaft* (a tendency to greater individualism and self-reliance). Parsons & Shils (1951) identify the axis of self-orientation versus collective-orientation as one of the five pattern variables which determine human action.

Hofstede (1980) finds that the axis can be used to categorise nations effectively and the resultant division has substantial predicting the economic system of the country. For example, he finds the United States characterised by a very individualistic value system. With this value pattern Americans typically have a relationship between the individual and the organisation which is calculative, and based on enlightened self-interest. He cites the presence of this

value system as explaining the popularity in the United States of expectancy theories of motivation. Etzioni (1975) found that an individualistic value set on the part of an employee went hand in hand with a more calculative involvement at work.

The incidence of a value set of this sort varies across the world. Scandinavian countries are classified as being less individualistic and calculative in Hofstede's survey. Macoby's (1986) study of Swedish values supports this. He refers to the local concept of *lagom*, which deems valuable behaviour which is subject to limits; to balance and restraint. "Limits on accumulating wealth are strengthened by the shared feelings about what is right, rooted in childhood admonitions that putting too much on one's place is not *lagom*," (p83). Macoby contrasts this with the greater "American urge to unbridle greed, to shoot the moon," (p83). Models of motivation based on *rational economic man* assumptions of calculative egotism are thus less consistent with Swedish society than is the case for the US, and can therefore be expected to be less powerful in predicting behaviour there.

In a major study of the differences of work values systems across the world, Drago et al (1989) highlight a marked contrast between the individualistic and competitive disposition of the American workforce and Australian concern for equality and "mateship".

7.5 Changing Values

It is not only across people that values, and hence the behavioral responses to payment systems, will vary. As soon as we accept that individuals' value sets can be, partially at least, internalised from the wider environment we repeal the assumption that the market economy can be treated as a separate system, basically self contained. We replace it with an assumption that the economy is a sub-system of a more encompassing society, polity and culture.

The values of individuals become linked to the wider social system, and hence are subject to change with that system - this is in keeping with the Lewin (1938) view of human behaviour as being determined by a combination of the personal and the situational. Himmelweit *et al* (1985) used the term *political socialization* to express the influence of an individual's contact with, and membership of, significant groups both in childhood and adulthood, on another dimension of decision making: casting a vote.

In a social world much of the interaction is with other *social* objects. However, allowing a place for the internalisation of values given by the social system does not inject a fundamental randomness into our analysis: for the social system to exist, some predictability and some stability are present. As Parsons has observed it is the fact that a shared language of norms and values exists between people which

explains and makes possible the very existence of human society.

How then can values in individuals change and vary across people and times? Parsons' Action theory proposes a systemic analysis. To maintain itself as a system there must be some interaction between the elements of a social system. In Parsons' analysis change within a sub-system arises from two sources; changes in the external environment, such as technological change or variations in the cultural universe given by other systems, and from endogenous sources - strains within the system itself, which may be an internal response to exogenous change. Such pressures for change need not necessarily result in values change: forces exist within a social system for the maintenance of equilibrium, which must be overcome, hence the relative stability of a system.
Values internalised from society *are* subject to change, therefore, in keeping with the principle of evolution that a system should have the capacity for generalised adaptation. Since the adaptation is to the dynamism of the whole social system this justifies the Weberian view that economics, as a section of society, should be analysed as such.

That values do change over time has important implications for behaviour which models must take account of if they are to retain their predictive power. The value system of parts of medieval Europe changes in response to changing external conditions, according to Tawney, resulting in new behaviour

identifiable as capitalistic. Likewise, certain American writers (eg Ravlin and Meglino (1987)) detect an erosion of the individualistic value system in American society which they fear will cause changes in behaviour which will damage US economic progress. Himmelweit *et al* (1985) argued for the importance of the *Zeitgeist* in causing shifts in individuals' evaluations of institutions in society which affect their political decision-making. In Chapter Two we discussed the view that a fundamental shift towards more individualistic values has taken place in Britain since the late 1970s.

In the context of pay systems, changes in the value system of workers (in response to the external environment) towards greater or lesser compatibility with the assumptions of human nature included in the design of the system, will be responsible for a given method of paying people being more successful at some times than others.

7.6 Values as a boundary condition for incentive pay models

Values consistent with calculative individualism, then, are not universal. Rather they vary between people and over time. Since we hypothesise that behaviour will be more likely to be observed if it is consistent with people's values than if it violates them, it follows that models of incentive pay founded on the *rational economic man* assumption that man is a calculative egotist will have greater predictive power among calculative egoists than among those who are more

collectivistic[1] and (after Etzioni (1975)) therefore less calculative in their value orientations.

Thus employees' individualism is a *boundary condition* for neo-classical models of incentive pay.

The relevance of this boundary condition and the transience of the assumptions of *rational economic man* are beginning to be recognised. Mitchell (1987), for example, observes that the pertinent question in models of motivation is shifting from being *does expectancy theory work?* to *where does it work?* Miller and Grush (1988, p107) note that "personal expectancies will determine the behaviour of some individuals and perceptions of social norms will determine the behaviour of others". The economist Arrow (1985) has acknowledged the transience of the underlying assumptions of neo-classical economics: in a contribution which has raised controversy among orthodox economists, he suggested that the laws of economics may not be true for all time, as in the natural sciences, but historically determined.

Hofstede (1980, p373) has noted the practical consequences of failing to pay proper attention to the boundary conditions of incentive models: "the silent assumption of universal validity of culturally restricted findings is frequent. The empirical basis for American management theories is American

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[1]After Deutsch (1973) 'collectivistic' refers to a motivational orientation which emphasises the welfare of others.

organisations, and we should not assume without proof that they apply elsewhere."

Outside the domain of individualism other theories of effort at work should be constructed and used. Shamir (1990), for example, has made a start in this direction by developing a 'collectivistic model of work motivation'.

Our hypothesis that individualism is a boundary condition of the incentive pay models discussed is in keeping with Popper (1959): specifying more closely the domain of models is an important means to increase their predictive power and therefore their usefulness.

7.7 The causality of values and behaviour

The systematic view of social action which we considered above implies a two way relationship between values and the environment. The adaptation function of Parsonian theory *gives to* the environment as it *receives from* it, to maintain the continuance of the system. Bem (1970) observes that one of the most effective ways of changing mental programmes of individuals is to change behaviour first.

If an individual's value set is one of the determinants of the behaviour which he would choose out of his own volition, the presence of power relations at work raises the possibility that people can be obliged to behave in a way which is

inconsistent with their value sets.

Within the system three responses are possible to such a situation. First the discrepancy between behaviour and values could contribute to a build up of tension in the system, but not to an extent which is sufficient to overcome the forces for stability (integration), so that no change takes place. Second, if the strain is stronger than the forces for stability the tension could have its issue in a change in behaviour which acts to reduce the misalignment of behaviour and values in the system. A third possibility, however, is that *values themselves* may adapt to achieve the maintenance of the system; that is values may follow behaviour, through the theoretical route of dissonance reduction.

Argyris (1964) has made this point, claiming that faced with a situation in which their required behaviour is at odds with their value system, workers will resolve the initial discrepancy in individual psychological terms.

Hofstede (1980, p27) regards changing first the *behaviour* of individuals as one of the most effective ways of changing value systems: he contends "that value change has to precede behaviour change is an idealistic assumption which neglects the contribution of the *situation* to actual behaviour.

To accept that behaviour affects values is to be consistent with a Marxist approach to the analysis of social action, and

indeed to the views of Marx himself. Marx held that revolutionary consciousness is a phenomenon that develops in response to the direct and practical experience by the proletariat of the contradictions inherent in the relations in which they are engaged. Direct evidence for this relation between behaviour and values can be found in the case of strikes. In the Belgian general strike of 1960-1, Bolte de Bel (1961) found that individuals previously identified as being moderates of low class consciousness, during the strike exhibited profound changes in class consciousness and political and ideological growth. Mann (1973, p73) claims that typically "during a strike a new form of rationality emerges, one not based on the summation of individual calculations but on collectivism as an end in itself."

The response of values to behaviour need not be made in this direction, however - it is plausible to suppose that values could change to become *more consistent* with those implied by the behaviour. Moorhouse and Chamberlain (1974) argue "to the extent that men are not committed to the values which underpin the way their society is organised, they must be, prospectively, more likely to be attracted to values, and to act on values, which seem more congruent with their social experience." Hence employees who work under a particular system of production will develop values congruent with that system: a modern capitalist system brings about 'privatised' workers who are commodity conscious, materialistic and private.

This theoretical possibility that values can follow behaviour, and hence that a system of organisation can bring about a value system which is congruent with it carries major implications. Without diminishing the role of values as a boundary condition for incentive pay it raises the possibility that causality could be reversed. Rather than an appropriate value system being a precondition for the successful functioning of a particular form of organisation, the value system could emerge in *response* to it. In the case of incentive-based pay we have the possibility that the introduction of a scheme could *bring about* the values of calculative self-interest which underlie its conception.

Several writers have investigated the possibility that new management techniques can bring about changes in the values of workers: changes which can be considered indicative of a New Industrial Relations. Kelly & Kelly (1990) detect in the New Industrial Relations literature one common theme: "this is the idea that organizational changes subsumed under the rubric of New Industrial Relations (including profit-related pay) will not only lead to changes in worker behaviour, but more importantly to enduring changes in underlying attitudes."

Admitting the role of values in incentive-based payment systems therefore includes not only an investigation of whether a value set of sufficient calculative individualism is necessary for success. It raises the question of causality - can incentive pay itself engender the value set required for

its success?

Hence two propositions follow from introducing individualistic values as a boundary condition of neo-classical models of incentive pay. The first is that the predictive power of these models will be greater among employees who are characterised by an individualistic value set than among those of greater collectivistic orientations. The second is the possibility that incentive pay, being predicated on calculative individualism, can give rise to a compatible value set among employees to whom it is applied.

SECTION III OPERATIONALISING THEORY

CHAPTER EIGHT - HYPOTHESES TO BE TESTED

8.1 Introduction

Previous chapters have provided us with three broad propositions to be tested by exposing them to the possibility of empirical refutation.

First, we argued that an expectancy-type model of the motivational process, which has been shown to be complementary to the economic approach, is a predictively powerful model, and therefore its implications can confidently be used in the design of incentive contracts.

Second, we argued that the predictive power of such a model can be enhanced by relaxing the behaviorally inaccurate underlying assumption of strict optimization.

Third, we postulated that respecting a boundary condition, defined by individualistic values, will enhance the model's predictive usefulness. In addition we raised the possibility that introducing an incentive pay contract could bring about the value conditions necessary for its success.

In this chapter we present a set of testable hypotheses which summarise these three propositions.

8.2 A basic expectancy model

In Chapter Five we presented a basic expectancy-type model of effort and pay, based on Galbraith and Cummings (1967). It was summarised symbolically as equation *3*:

$$W = E.I.V \qquad 3$$

where

W = effort

E = the expectancy that effort leads to performance

I = the instrumentality of performance for the attainment of pay

V = the valence of pay

Expectancy, instrumentality and valence are combined multiplicatively to determine how much effort an individual decided rationally to supply.

To advance such a model as a useful depiction of the motivational process is to hypothesise that:

H1: Expectancy, instrumentality and valence predict a significant proportion of effort

H2: The interaction of expectancy, instrumentality and valence explains a significant proportion of effort supplied.

8.3 Structural modifications to the basic model

We propose two modifications to the structure of the basic expectancy model represented by hypothesis *H1*. The first is based on the requirement that our hypothesis be open to empirical testing: we argue that as it stands, it is not possible to test positively *H1* because the valence component cannot be meaningfully operationalised. The second draws from the contribution of Chapter Six in arguing that the optimization postulate should be relaxed. Hence the multiplicative form of the basic model is more apporiately replaced by a form which is less computationally rigorous.

8.3a Model Structure: *ex ante* and measurable valence

The model summarised above is forward-looking. By knowing the expectancy, instrumentality and valence perceptions which an individual holds at period zero the theory predicts effort supplied at period one. However, it is impractical to test the theory in this way: in field tests a payment system is already in place, so that period zero has long since passed. Testing the theory must rely on imputing values for expectancy, instrumentality and valence to period zero. This is typically done by assuming that the perceptions are constant between the periods, so that expectancy perceptions recorded in period one are a reasonable estimate of those held *ex ante* (in period zero).

Such an assumption, however, leads to a flaw in the standard operationalisations of the expectancy model for testing in the field. While, *ceteris paribus*, there is no reason to suppose that expectancy and instrumentality perceptions *will* change between periods, given that these are determined by the objective situation (ie the pay contract, assumed unchanged) and the individual's subjective reaction to it (also assumed unchanged), this is not the case for valence. Even under a *ceteris paribus* assumption there is strong reason to expect that valence reports, recorded in period one will not be suitable to estimate *ex ante* (period zero) valence. This important possibility is rarely acknowledged by empirical researchers, despite the ambiguous role measured valence has been found to have in field tests of expectancy-type models.

Valence is defined by Vroom (1964) as the anticipated satisfaction attached to an outcome. In field tests employees are usually asked to report (i) the importance (ii) the desirability or (iii) the attractiveness of pay to them. The responses are used as empirical proxies for valence. Since they cannot be applied at period zero, such instruments record anticipated satisfaction of pay at period one, in which employees are already receiving pay.

These *ex post* reports of pay's valence would be valid estimates of pay's valence at period zero if the valence of pay were constant for all amounts of pay. This would be to assume that individuals' returns to pay, in terms of

anticipated satisfaction, were constant.

We argue that this is not the typical case. In section 5.3 we allowed that money was less instrumental in attaining satisfaction of the higher rungs of Maslow's hierarchy of needs than the lower rungs: accordingly the anticipated satisfaction conveyed by money would decline the more an individual accumulated (and thus satisfied the lower needs). The anticipated satisfaction associated with money would therefore be subject to diminishing returns. Assuming that the valence of money in period one (in which the employee has been paid) is the same as that in period zero (when no money has been earned) conflicts with one of our fundamental assumptions concerning money as a motivator.

The view that *ex post* measures of valence differ in their behaviour from the *ex ante* measures required by the model implies a set of hypotheses of the behaviour expected which is different to hypotheses *H1* and *H2*.

Valence in Field Tests: An Economic Approach

Valence and Expectancy/Instrumentality

In Chapter Three we presented a model of pay and effort in which employees found disutility in supplying effort (a diminution of leisure), but positive utility in pay, which was determined by effort supplied. The employee faced with such

a situation would choose to supply effort at a level at which the marginal rate of substitution between income and leisure (and all other goods) was equal to unity.

An employee whose *ex ante* anticipated satisfaction from pay (ie its valence) was unusually high would choose a bundle of effort and pay to be delivered in period one which contained an unusually great amount of effort, and therefore pay. This is in keeping with Vroom's model. Having chosen this bundle, the employee's anticipated satisfaction associated with pay would, when measured at period one, be by definition equal to that attached to leisure and all other goods. In a field test, which measures valence at period one, such an employee would therefore *not* report a high valence for pay relative to other outcomes.

Consider, however, a payment system which substitutes a fixed wage for effort-determined pay. Again, an employee's *ex ante* valence of pay will determine the composition of the effort-pay bundle which he would optimally choose for period one. However, the fixed wage forces on the employee a particular level of pay at period one which cannot be changed. If this amount is below what he would have chosen for himself the employee's anticipated satisfaction from pay (its valence) at period one will still be greater than unity relative to all other goods. In the context of such a system valence recorded at period one would be relatively high.

In short, period one valence is determined by the amount of money paid, relative to what amount would be chosen. Since the payment system determines the extent to which an employee is allowed to realise his chosen level of pay, the payment system determines period one valence, the valence recorded in field tests.

If the payment system is perceived to offer a strong relationship between effort and pay (ie expectancy and instrumentality are both high) then individuals can realise their chosen level of pay, with the result that period one valence will be low.

If the payment system does not allow employees to realise their chosen level of pay (ie expectancy and instrumentality are both low), but the wage paid in period one is higher than the level of pay which would optimally have been chosen, then period one valence will again be low.

However, if the pay system does not allow employees to realise their target pay in period one and the wage paid to them is lower than that target, period one valence will be high.

Far from being independent, as assumed in the usual operationalisations of the expectancy model (reflected in hypothesis *H1*), valence when measured at period one is *determined* by expectancy and instrumentality. Hence if our argument is to be shown to be correct the alternative set of

hypotheses which must survive falsification in empirical field tests are:

H3: Measurable valence will be high when expectancy and instrumentality are perceived as low and pay is perceived as low.

H4: Measurable valence will be low when pay is perceived as high.

H5: Measurable valence will be low when expectancy and instrumentality are perceived as low.

Valence and Effort

The implication of the economic analysis of Chapter 3 was that a fixed wage system will tend to depress the level of effort supplied. Marginal increases in effort are unrewarded, and marginal decreases go unpunished, causing Rational Economic Man to take more leisure at work than he would under an incentive-pay regime. We have argued above that the perception that pay is genuinely determined by effort (ie high expectancy and instrumentality perceptions) determines the measured valence of pay. That is, the same factor which causes measured valence to be low also causes a high level of effort to be supplied. Thus, effort and measured valence are covariates: both a function (one positive, one negative) of expectancy and instrumentality perceptions. Accordingly we predict that field tests of expectancy theory will find a *negative* association between effort and the measured valence of pay. This prediction contrasts with the positive, causal

relationship predicted by conventional operationalisations of the expectancy model for field tests. As such, for our argument to be supported a new hypothesis *H6* must be preferred to *H2*:

> *H6: Effort and Measured Valence will be negatively associated.*

Implications

Hypotheses *H1* and *H2* summarise the conventional conception of the behaviour of measured valence in field tests of expectancy theory. They are founded on an implicit assumption that the valence of pay is constant whenever measured. Hence measuring valence during the operation of a pay system is a valid means of imputing the *ex ante* valence of the Vroomian model.

The competing set of hypotheses *H3*, *H4*, *H5* and *H6*, summarises an alternative conception of measured valence. It posits that the valence of pay diminishes as pay is accumulated, so that measuring valence when pay has been received is not a suitable empirical proxy for the *ex ante* valence necessitated by the Vroomian model. This alternative is in keeping with our psychological assumptions made in Chapter Five concerning the motivating potential of money.

If our alternative set of hypotheses is preferred empirically to *H1* and *H2*, then empirical tests of expectancy theory which

mix *ex ante* with *ex post* introduce distortions which can undercut the predictive power ascribed to the theory. A model which should be no less powerful and more parsimonious would be advanced by omitting the misspecified variable.

8.3b Model structure: the optimization postulate

The hypotheses which summarise the claims made for the orthodox expectancy approach are

H7: *Expectancy and instrumentality predict a significant proportion of effort*

H8: *the interaction of expectancy and instrumentality is a significant predictor of effort*

H7 summarises the content of the model and *H8* its structure, *H8* implying a multiplicative combination of expectancy and instrumentality.

In Chapter Seven we argued that expectancy theory shares with neoclassical economics a set of assumptions about human nature, which we characterised as those of *Rational Economic Man*. One particular such assumption was that agents determined their behaviour by optimizing over a set of possible outcomes, so as to maximise their utility. The behaviourists' criticisms of this assumption were considered.

They argued that in most instances strict maximisation is beyond the computational abilities of agents, and that a less rigorous consideration of relevant variables is more representative of actual human decision making. The multiplicative interaction of expectancy and instrumentality posited in hypothesis *H8*, in the light of these criticisms, appears to be in keeping with the optimization assumption but overly restrictive from a behaviourist's point of view. In the view of Mitchell (1982), for example, it over intellectualises the motivational process. Accordingly, an alternative specification of the model, one in which a strict multiplicative combination of expectancy and instrumentality was departed from, may increase the realism and thereby the predictive power of the model.

Allowing a different structure for the expectancy model requires proposing an alternative hypothesis to *H8*, which summarises the orthodox structure. Accordingly hypothesis *H9* makes testable the possibility that a functional form departing from strict global rationality predicts effort better:

> *H9: Non-multiplicative combinations of expectancy and instrumentality predict a greater proportion of effort than does a multiplicative combination.*

Empirical testing for hypotheses *H7*, *H8* and *H9* will indicate the predictive power of the expectancy model, and distinguish

between alternative specifications of it.

8.4 Boundary Condition of the models

We have argued that the neo-classical economic and expectancy theoretic models of effort and incentive pay are based on an assumption that agents' decision-making is calculative and individualistic. We have also suggested that people's value sets include dimensions such as their relative individualism, and that these vary between people. Accordingly when neo-classical models are applied to people whose values depart from those assumed, the models are misapplied and substantial predictive power is not to be expected from them. Here we derive hypotheses which represent this view.

We hypothesise that the model will be a more accurate means of representing the motivational process among employees of individualistic values then among workers of relatively collectivistic values. This implies hypothesis *H10*:

> *H10: The predictive power of the model will be greater among employees of relatively individualistic value sets than among employees of relatively collectivistic value sets.*

In section 7.4 we discussed the implications of the possibility that behaviour can shape values as well as values governing the choice of behaviour. Several writers (eg

Moorhouse & Chamberlain (1974)) have made the argument that changing the behaviour of individuals can bring about value changes which make the two congruent. Such a hypothesis is in keeping with the Parsonian view that its outlet in value change which tends to assure the maintenance of the system.

Applied to incentive pay, the argument states that introducing an incentive contract predicated on calculative individualism can bring about in employees to whom it is applied, these critical values. This implies that, *ceteris paribus*, employees covered by a cash bonus system, or employees who own shares in their company, will be more likely to display individualistic value sets than employees who are not included in such schemes. We should therefore test empirically hypothesis *H12*:

> *H12: Employees covered by an incentive-based contract will display greater individualism than those not included.*

8.5 Incentive Pay and Effort

If it is demonstrated that the expectancy model of incentive pay and effort have predictive power, and that it is more powerful among employees of relatively individualistic value sets, then a set of hypotheses concerning the motivating effects of incentive contracts follows. Since incentive contracts (such as performance-related bonuses and employee

shareholdings) objectively increase the performance-extrinsic rewards relationship it will be expected that the instrumentality perceptions of those covered by these contracts will be enhanced, relative to employees not included in the schemes. Under the model presented this would imply that employees covered by an incentive contract will supply more effort than those of their colleagues who are not included in such a contract.

However, having argued that the model is applicable only to employees of relatively individualistic value sets, it follows that the model's prediction holds only for this type of employee. That is to say we expect an incentive contract to result in relatively high effort among individualistic subjects, but to have no significant effect on employees characterised by a relatively collectivistic value set. This can be summarised in two hypotheses:

H13: employees (i) covered by an incentive pay contract and (ii) who hold a relatively individualistic value set will supply relatively high levels of effort.

H14: employees (i) covered by an incentive pay contract and (ii) who hold a relatively collectivistic value set will supply no more effort than employees not covered by incentive pay.

These hypotheses constitute a positive theory of effort,

values and pay. The confidence we can place in the theory will be established by the ability of the hypotheses to withstand attempts at falsification by subjecting them to empirical scrutiny. To do so requires us to specify empirical proxies for the conceptual variables included in our hypotheses. To this end the following chapter establishes an empirical sample in which to test hypotheses *H1* to *H14*, and derives empirical proxies to operationalise the hypotheses.

CHAPTER NINE - EMPIRICAL STRATEGY

9.1 Introduction

The model which we have constructed claims that incentive pay will motivate effort most effectively among employees who are characterised by an individualistic value set. It will be comparatively less successful among collectivistic workers. Friedman maintained that many apparently intractable theoretical disputes can be settled by empirical evidence. To this end Chapter Eight has supplied a set of hypotheses which summarise the implications of the model, and which are in principle suited to empirical testing. After Popper (1959), the greater the demonstrated ability of the hypotheses to withstand attempts at empirical falsification, the more dependable is our model and hence the greater is our confidence in the inferences and prescriptions which we deduce from it.

Testing our model empirically requires choosing an appropriate research strategy. We must specify suitable empirical equivalents or proxies for the variables contained in hypotheses *H1* to *H14*: in order to do this we must determine what type of data will form the sample, where it is collected and by what means. A sizeable array of choices presents itself to the researcher in building a research strategy: at least five major decisions must be taken. These are:

i) whether data should be collected by means of a

controlled experiment or by obtaining observations of actuality;

ii) whether the data collected should be of an objective or subjective nature;

iii) whether the data aim to be representative of generality, or case-specific;

iv) whether the data should be time series or cross sectional;

v) which instruments should be used to collect the data.

An ideal research strategy consists of choices within this set which are shaped by the nature of the model to be tested, and its associated hypotheses. In the light of the model and hypotheses which we have expounded we discuss what would constitute an ideal research strategy for our analysis. Having done so we assess a practical research strategy against this ideal.

9.2 An ideal research strategy

9.2a The Research Setting: Experimental or Observational

An experimental strategy for collecting data would typically consist of obtaining a group of subjects' responses to controlled variations in conditions, or to hypothetical situations presented to them for consideration. The great advantage of such a strategy is that it removes from the analysis the 'noise' elements which are inherent in empirical research which draws evidence from actuality. As such the researcher can confine his analysis to the particular

relations which interest him.

However, it is not an ideal strategy for our purposes, for several reasons. First, our analysis concerns behaviour at work, and the opportunity to experiment with the systems and the workforce of a functioning organisation (that is, to deliberately alter conditions at work in order to assess the results) is unlikely to be feasible: organisations have commercial and other objectives to meet which such experimentation could interfere with.

One response would be to conduct research under an experimental strategy outside the firm and in a laboratory setting. However, by design, conditions which prevail in the laboratory are not those which prevail at work. Our model explicitly considers behaviour at work. Many of the conditions present at work may influence responses made to the working environment (for example 'team spirit' built up over the years). It will be difficult for the researcher to identify these conditions, to assess whether they are pertinent to the analysis and if so, to replicate them in a laboratory setting. For example, we argued in Chapter Seven after Moorhouse (1976) that subjects' cognitive recognition of their behaviour may emerge gradually as they practise it. The implication of this is that in laboratory conditions, where the situation is, by design, abstracted from everyday experience, we will be unable to pick up the cognitive aspects of behaviour in the working environment which have become

revealed to subjects over time.

An ideal research strategy for our model will be based on collecting data 'from life' rather than through laboratory experiment.

9.2b Type of Data: Objective or Subjective

Data collected to test our hypotheses can be objective (based on externally observed phenomena associated with the subject, such as his output per day, or externally rated intensity of work) or subjective (capturing the subject's own perceptions of his behaviour, for example the effort which he supplies).

Economic models of incentive pay have typically adopted a research strategy based on collecting and analyzing objective data[1]. In Chapter Four we argued that limiting their analysis to such a strategy had the result that the robustness of the incentive model could not be established with confidence. The presence of incentive pay in a company (an objective piece of data) could not rigorously explain relatively high productivity in that company (another objective piece of data) because the incidence of incentive pay could either be a benign covariate of another variable (eg superior management), or be subject to reverse causality (high productivity may

[1] See Table 3.2

provide leeway for cash to be distributed through bonuses).

This is not to deny the value of a research strategy based on the collection of objective data: rather, as we argued in Chapter Four, we believe that further studies of this type will be less valuable to the progress of the debate at this stage than studies which seek to open up the black box of causality in economic models by specifying a complementary motivational process. Our model represents such a process, and since its components are cognitive, subjective reports are required to test the model: *perceived expectancy*, for example, cannot be objectively observed. Effort too is open to subjective testing since it is a type of behaviour of which the subject is cognizant[2].

Objective observation as an empirical strategy denies us the opportunity of testing the cognitive perceptions which we postulate form a chain linking behaviour with certain antecedent conditions. Subjective reports must therefore be obtained in order to test our model.

9.2c General or Case Study

Having decided that a 'real world' research strategy is best suited to our purposes we are faced with a choice between a case study approach, which would take the form of a detailed

[2]For a discussion of the possibility of obtaining subjective reports of effort see Guest (1990).

examination of the operation and effects of incentive pay in a particular company, or an empirical exercise which aims to reflect generality to some degree.

Much of the research to date in the field of incentive pay has been carried out under a case study strategy. Given the comparatively isolated incidence of companies practising formal incentive programmes, it is not surprising that particular firms are analyzed as 'showcase examples' (for example the John Lewis Partnership, studied by Bradley and Taylor (1992)). The case study approach typically benefits from a detailed picture of the contextual background, with opportunity for the sensitive consideration of qualitative aspects of the system and its effects.

The principal drawback of a case study strategy is methodological: with what justification can the findings of case study research be claimed to have a general applicability? If conclusions are drawn from the analysis of a specific case, prescriptive inductions are strictly valid in the context of that case only. This is limiting for testing a model such as ours which is *explicitly general* in its approach, delineating a boundary condition for traditional neoclassical models. Whilst it is true to say that particular case studies may achieve generality for their implications by feeding into a larger literature of other individual cases, in the analysis of values and their role in incentive pay no such body of evidence exists. To be able to claim general

applicability for our hypotheses, therefore, they must withstand falsification by data which is as reflective as possible of generality. Accordingly a survey approach is to be preferred to a case study at this stage in the research of the issue.

9.2d Time Series or Cross Sectional

A longitudinal (time-series) dataset which covered both the period before the introduction of an incentive payment system among employees and the period in which it operated would, on the face of it, be a suitable means for testing hypotheses *H1* to *H14*. The effects on effort of introducing more incentive pay could be clearly compared for those groups of employees who hold collectivistic values, and those who are more individualistic. In addition the change in values of subjects could be analyzed in response to the introduction of an incentive system. The major advantage of a time-series dataset is that the effects of a new system are made highly visible because they can be set against a *benchmark* of relevant behaviour associated with the previous system.

Compiling a time-series dataset presents difficulties to the researcher, however. Firstly collecting data on successive occasions imposes logistical and financial burdens: the number of companies which are *about to* introduce an incentive scheme at a particular time is likely to be fewer than the number currently practising such systems. In addition, identifying

and securing access to these companies in advance is constrained by information and resources.

A second drawback of a time series-based strategy is the difficulty in determining whether any changes which are found to have taken place are a result of a *change* in the regime rather than the new system *per se*. An examination of employees' values and perceptions in the context of a mature payment system may be more dependable than one based on a context which is in flux. This is especially important in the context of Moorhouse's (1976) view that it may take time for subjects to become cognizant of the values and motives which govern their behaviour in response to their environment. These factors combine to make it likely that a longitudinal survey of employees before and after the introduction of incentive pay will be confined to a very much smaller number of employees than would be possible if incentive pay systems were examined *in situ* by means of a cross-sectional strategy. Accordingly a time-series survey would tend towards a case-study type at the cost of the more representative analysis which we aim for.

A cross-sectional analysis takes a single picture of a sample of subjects as a basis for testing hypotheses. In doing so it runs the risk of attributing causal importance to conditions present in the snapshot picture which a cross-sectional sample provides, but which in truth are no more than stochastic phenomena. To counteract this problem, the size of a cross-

sectional sample should be large in order to be able to minimise stochastic variability in observations.

A large, multi-period time series sample would seem to be the *ideal* choice in a research strategy suited to testing our set of hypotheses. However, a more *practical* strategy would be a large, cross-sectional body of data.

9.2e Research Instruments

Having determined that data collected to test our hypotheses should ideally be based on the subjective reports of actual employees on their behaviour at work, values and perceptions of performance-reward contingencies, we must specify a suitable research instrument to obtain these reports. Two principal options are available for this: an interview-based strategy and a questionnaire-based strategy.

There are many variants of an interview-type strategy, which range from the unstructured to the tightly structured. Given that we have certain clearly identified relationships which we wish to test, any interview strategy which we were to adopt would tend towards the structured. However, qualitative data which results from interviews is difficult to pool and derive the robust statistical inferences from which are appropriate to making defensible general statements. Indeed, the more one attempts to achieve commensurability of responses, the more one loses the richness of the qualitative nature of interview data. Drawing out general associations from a large set of interview data is a difficult task, since each case needs to be considered independently, and can contain inconsistencies deriving from the lack of complete replicability of interviews. For our purposes the interview is a tool which is unsuited to testing our model. In addition, in order to obtain a sample form which general inferences may be drawn, a large number of functions, firms, positions and geographical

locations would need to be considered, with statistically significant numbers of observations in each category. This being the case, the resource cost of interviews, coupled with their unwieldy nature in the context of our purpose, lead us to reject them as the basis for an ideal research strategy.

The type of model which we have proposed, and the ambitions for general prediction which we have, make a large scale quantitative strategy appropriate. To obtain subjective responses from employees a questionnaire survey is the most appropriate means to effect it.

This is not to say that a questionnaire approach is without its drawbacks. The objectivity of a questionnaire as a research instrument is, as in the case of interviews, ambiguous. It can be argued to be, however unwittingly, 'theory laden', so that it reflects the assumptions of its compiler. Moreover, the interpretation of questionnaires is open to ambiguity. If a person's questionnaire reports of his desires and aversions are voluntary responses it may be possible to explain them in terms of processes similar to those involved in other kinds of voluntary behaviour. That is, a statement that X is preferred to Y implies not that X is preferred to Y, but that the consequences of saying X outweigh those of saying Y. Accordingly, questionnaire instruments present an incentive compatibility problem which their design must address.

The reaction to this criticism of questionnaire-based survey strategies is to reduce and de-emphasise the consequences attached to making responses of whatever sort. One means of doing so is to assure (and communicate the assurance of) the anonymity of responses.

There are, in addition, a number of reasons why questionnaire surveys in particular, and the analysis of subjects' self-reports in general, have been criticised as research strategies. It can be argued that even where further consequences are not perceived to exist, subjects will make responses which may reflect the social desirability of certain answers, boosting the subject's own self-image. Questionnaires may give rise to cognitive justification for actual behaviourial manifestations which may be sub-conscious: for example, an employee who exhibits superior performance behaviour may cognitively justify this behaviour as being effort-caused, whereas it may be due to non-personal factors such as available equipment, or non-controllable factors such as personal aptitudes. These problems associated with questionnaire-based research have not been resolved, and in the absence of a widely accepted solution we raise and acknowledge them as factors which attenuate the analysis of any questionnaire-based strategy.

9.2f An ideal research strategy: summary

The proceeding discussion has identified certain criteria

which should be met in an ideal research strategy suited to testing empirically our hypotheses. Data should ideally be collected in a functioning enterprise, in a survey-format rather than a specific case-study. It should consist of subjects' own reports of their perceptions, values and behaviour, and is more usefully gathered by means of a questionnaire instrument rather than interviews. Time-series data is valuable in assessing the effects of introducing incentive pay, but suffers from drawbacks including the effects of change *per se* on responses, and on the greater problems of access and resources. Cross-sectional data must be collected in substantial quantity to overcome the potential for random variation to be accorded causal status.

9.3 An Available Dataset

In November 1988 the London School of Economics Business Performance Group conducted a large scale opinion survey among the managers and employees of fourteen companies which were owned by Expamet International plc. This was part of a joint consulting-research project with the company, which sought to gauge the opinions of the workforce on a set of issues which included job satisfaction, pay and benefits, work organisation, working conditions, commitment and trade unionism[3]. The dataset was available as a possible sample to

[3] The project was funded by the parent group on the basis that the Business Performance Group would provide consulting reports based on the data, which would be available for use in research projects.

use to test empirically hypotheses *H1* to *H14*. To determine whether a *secondary analysis* of this data would be a suitable research strategy, we examined the characteristics of the dataset in the light of the *ideal* requirements discussed above.

Research Setting: The survey was conducted among the employees of fourteen operating companies. The payment systems which prevailed were mature (no major changes having been made in the two years proceeding the surveys) and the median length of service of employees surveyed was between 4 and 5 years. Questionnaires were administered to employees at their place of work, during working time. These factors establish that the objective of a 'real world' research setting is met by this sample.

Objective/Subjective: The survey used a questionnaire instrument to obtain employees' subjective ratings: this is in accordance with the ideal strategy which was determined above for testing our model.

General survey/case study: The discussion above recommended that a sample which was as representative as possible of companies widely should be used to test our model, which was explicitly general in its approach. While the dataset available referred to a single group of companies, the fourteen companies surveyed were diverse. Each business, had its own Chief Executive and management. The companies ranged

from the very small (18 employees) to the moderately large (575 employees), in sectors which included building products, security services, metal components and software services. The 14 companies surveyed were distributed across England and Wales from Hartlepool to Bristol, Merseyside to Kent, as table 9.1 illustrates.

Table 9.1

Summary of Companies Surveyed

Company	Location	No Employees
APT Controls Ltd	Middlesex	131
BAT Building Products Ltd	Salop	220
Cash & Security Equipment	Herts	170
CQR Security Systems Ltd	Merseyside	88
Expanded Metal Company Ltd	Cleveland	575
Fawcett Christie Hydraulics	Clwyd	89
Industrial Building Components	Cleveland	120
Maximal Ltd	Surrey	80
Mayor Turnstiles Ltd	Kent	46
Mitra Plastics Ltd	Salop	56
Phoenix Controls Ltd	Essex	18
Signfix Ltd	Avon	38
Software Control Ltd	Cheshire	42
Videoscan Ltd	Cheshire	92

The dataset was compiled from a cross-sectional survey: a

snapshot of employees' opinions in 14 companies in November 1988. The size of the sample is very large compared to previous samples used to test models of payment systems. 1265 surveys were returned by employees of the 14 companies: a response rate of 72 per cent of all employees of the 14 companies.

All sections of the workforce in each company were surveyed, including managers, professional staff (eg engineers and accountants), clerical staff, salesmen and shop floor employees. Six hundred and thirty five employees (50.4 per cent) were classified as shop-floor workers; 189 (15 per cent) as managers; 206 (16.3 per cent) as supervisors; and 160 (12.7 per cent) as clerical staff. This represents a more comprehensive dataset than many of those used in previous tests of models of payment systems, which have consisted of data from a single type of employee, usually managers (see, for example, Porter and Lawler (1968)).

The median age group of those surveyed was 31-40 with 8.8 per cent under the age of 21 and 18 per cent over 51.

Time-series or cross-sectional: In section 9.2d above we discussed whether a time-series or cross-sectional dataset was best suited to testing our hypotheses. We argued that while cross sectional data did suffer from being unable to facilitate a 'before and after' analysis, it could be used in the context of a mature system in an analysis which included

a greater number of companies. For the distortions arising from stochastic error to be small, however, in a single snapshot sample, a large number of cases would need to be included in this survey. The size and breadth of the sample, discussed above, lead us to conclude that its cross-sectional design is acceptable as a sample for testing our hypotheses.

Survey Instrument: We identified, in section 9.2e above, a questionnaire instrument as being the most appropriate for obtaining a data sample with which to test our hypotheses. The Expamet survey was based on administering a common questionnaire to the employees of all 14 companies. To ensure that responses were as candid as possible the confidentiality of responses was emphasised in keeping with the requirements of section 9.2e. Before the survey employees received a letter on London School of Economics paper emphasising the confidentiality of their responses, "*No-one* at your company will therefore see the responses to your questionnaire. We also stress that you should *not* write your name anywhere on the survey or envelope. This again will help ensure confidentiality to you."

In addition, the first page of the questionnaire included a similar assurance, "The questionnaire is completely confidential. Your name should *not* appear on any part. Furthermore, the computer at the London School of Economics will process all information so that *no-one in your company* will have access to your completed questionnaire." In

addition, employees had been told that the researchers were concerned with *aggregate* data, thus providing a structural basis for the assurances of anonymity.

Questions solicited responses on a five point Likert scale for most questions, with the scale ranging from 'strongly agree' to 'strongly disagree.'[4] Profiling data (such as sex, length of service and position in the company) required a specific response.

The questionnaires were administered to employees at their workplace, during working time. Questionnaires were administered between 9 and 28 November 1988 sessions supervised by the researchers in the nine largest companies surveyed. These accounted for 89 per cent of respondents, and also 89 per cent of total employees in the 14 companies. The remaining five companies, accounting for 11 per cent of respondents and employees, were surveyed by providing employees with sealed envelopes for each questionnaire and a 'ballot box' type receptacle at their workplace. These boxes were returned, unopened, to the London School of Economics by the companies.

The questionnaires contained 253 data points: a size very much larger than is usual in surveys of employees. The conditions

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[4] For a discussion of the advantages of a five point Likert scale cf Van de Ven & Ferry (1980). They suggest that a five point range is optimal and that it is difficult for respondents to differentiate degrees of intending with either a smaller or larger range.

under which the questionnaires were administered, and the scale of the survey, made it a potentially extremely valuable resource. To replicate such a survey, which met each of our ideal criteria for a research strategy, would be extremely costly in terms of resources.

9.4 Conclusion

To a considerable extent conducting an analysis of the Business Performance Group survey would be consistent with the ideal research strategy which we described in section 9.2. However, analyzing this dataset in order to test empirically our hypotheses is clearly only possible if its *content* included acceptable proxies for the variables in our model. A first view of the questions asked suggested that some of them could be argued to reflect theoretical concepts in our model. In particular, data were obtained on the incidence of two dimensions of incentive pay: cash bonuses and employee share ownership.

Appendix 1 lists the questions included in the survey which were thought to be potentially appropriate for testing our model. Appendix 2 describes the incentive pay elements in the companies surveyed.

Chapter Ten assesses whether these questions provide an adequate basis for constructing empirical proxies for the variables in our model.

CHAPTER TEN - DEFINING EMPIRICAL PROXIES

10.1 Introduction

Having derived a set of testable hypotheses, and specified a data sample which can be used to subject them to empirical scrutiny, we now develop empirical proxy variables for the variables contained in hypotheses *H1* to *H14*. In particular, suitable scales must be advanced to denote effort, valence, expectancy and instrumentality, and employees' value orientations.

10.2 Methodological Considerations

To obtain empirical proxies for the conceptual variables we construct a set of scales which comprise a number of questions designed to tap the conceptual variable in question.

Constructing such scales is preferred to advancing individual questions as empirical proxies in their own right. Gathering a number of different items in one scale widens the domain of possible scores, making distinctions between high, low and medium scores more robust. Furthermore, individual questions in the survey do not measure the conceptual variable directly, and may reflect the influences of a number of different conceptual variables. By constructing a scale of individual items these extraneous influences are averaged out, with the scale capturing that part of variation in the items which

moves with the other hypothesised items, i.e. that part hypothesised to reflect the conceptual variable being studied.

Means must be established to assess the suitability of constructs advanced as valid measures of a hypothetical variable. Two criteria in particular must be met: the construct should display internal consistency and external consistency.

Internal consistency assesses the degree to which the components of a construct can be said to reflect an overarching concept. For this to be satisfied the components must show some signs of varying together across different circumstances. In psychometric studies internal consistency is most commonly measured by Cronbach's coefficient Alpha (α), derived from the strength of correlations between seperate items of a construct. Nunnally (1967, p226) recommended that alphas of 0.5 and above should be regarded as denoting sufficient internal consistency for empirical constructs in basic research. Since we are embarking on an empirical investigation of psychological processes we adopt this convention as the criterion for internal consistency.

External consistency is the second criterion which an empirical construct must satisfy. It assesses whether the name of a hypothetical variable can be justifiably given to an empirical construct. For example, how can we say that a set

of empirical items, which demonstrably move together,[1] denote the concept of instrumentality? The requirement for external consistency can be thought to be satisfied in various ways. First, it can be demonstrated that a construct behaves similarly to other constructs purporting to measure a particular concept. Secondly, if the individual items of a construct can be shown to relate directly to the theoretical definition of the concept, the requirement for external consistency will be satisfied.

10.3 Effort

In Chapter Four we defined effort, for the purposes of investigating the effects of incentive pay, as a class of behaviour, cognitively and purposively supplied by individuals, which is expected to contribute positively to production. Since we argue that an essential characteristic of effort is that the agent is cognizant of his own behaviour in this respect, it follows that if the individual will report accurately on questions pertaining to his own effort, then an instrument of this type can be a practical means of obtaining empirical measures of effort. By taking effort-reports directly from the subject we can bypass the host of uncontrollable factors which, outside the laboratory, makes inferring effort from objectively observable, secondary phenomena (such as output per unit time), notoriously difficult. Against using agents' self-reports as an empirical

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[1] Thereby displaying internal consistency.

proxy for effort, however, there exists the possibility that subjects will supply untruthful responses. This would introduce bias into the effort measure.

Insofar as supplying more effort is considered to be a desirable act - either personally, socially or professionally - subjects may tend to exaggerate upwards their responses to items which seek to represent their effort supplied: so-called 'halo effects.' Two possibilities explain this. First, subjects may consider that their responses will be seen by someone who knows them it will be advantageous to exaggerate their responses since this could lead to professional advancement or social approval. In other words, the expected benefit of claiming to supply high levels of effort is positive. This possibility, however, is limited by the research conditions under which the survey was conducted. The name of the respondent did not appear on the questionnaire, company personnel were not involved in administering the questionnaire, and the confidentiality of the responses was explicitly emphasised. This would tend to lead to more truthful responses.

The second possible explanation for upward exaggeration of self-reported effort is that such behaviour boosts subjects' own self-image. However, if exaggeration is a general tendency on the part of respondents then we would expect, *ceteris paribus*, that the mean self-effort rating would be increased by a constant over its 'true' value. If we use

effort reports as an indicator of *relative* effort rather than an absolute measure effort such a step increase in the mean of reports does not disturb our analysis.

In Chapter Four, we accepted the contribution of economic theory which emphasised the intractable interdependence of employees' behaviour in joint production companies and the productive benefits of peer group monitoring. To be in keeping with this contribution our empirical construct for effort, behaviour which contributes positively to production, should include items which reflect interaction between employees.

Five questions in the survey were designed to reflect employee effort: these are listed in table 10.1. Responses to the items were obtained on a five-point Likert scale.[2]

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[2] 1 = strongly agree
2 = tend to agree
3 = neither agree nor disagree
4 = tend to disagree
5 = strongly disagree

Table 10.1
Effort Items

Label	Question
EFF_1	I am willing to put myself out to help my company.
EFF_2	I help and encourage fellow workers in my team.
EFF_3	It is important for employees to do all they can to increase company profits.
EFF_4	It is none of my business if workers in my team sometimes take it easy on the job.
EFF_5	It is none of my business if workers in my department sometimes take it easy on the job

The correlation matrix of these five items shows that each item is correlated with the remaining items in the expected direction. Pearson's coefficient of correlation for each is significant at above the 99 per cent level. This matrix is reproduced as table 10.2

Table 10.2
Effort Items: Correlation Matrix

Item	1	2	3	4	5
EFF_1	1.0**				
EFF_2	0.2995**	1.0**			
EFF_3	0.2615**	0.3971**	1.0**		
EFF_4	-0.2769**	-0.3203**	-0.2670**	1.0**	
EFF_5	-0.3438**	-0.3906**	-0.3132**	0.6235**	1.0**

** *significant at >99 per cent*

A principal components analysis of the five items demonstrated that a single common factor explained 48.3 per cent of the variation between the items. Table 10.3 reports the loading coefficients onto this factor.

Table 10.3
Effort Items: Factor Loadings

Items	Loading Coefficient
EFF_1	-0.6004
EFF_2	-0.6901
EFF_3	-0.6216
EFF_4	0.7431
EFF_5	0.8007

Regression method factor scores were obtained, and used to construct a scale consisting of the five items. The scale, henceforth EFFORT, varies with a standard deviation of one about a mean of zero. Excluding cases which contained a missing value for one or more of the component items, 998 cases had an EFFORT value computed. Coefficient Alpha for the scale was 0.72, comfortably exceeding the 0.5 accepted as the criterion for acceptable reliability.

10.4 Expectancy and Instrumentality

In Chapter Four we argued that the confidence placed in neo-classical economic hypotheses of incentive pay could be increased by opening up the economists' black box of causality and specifying a complementary process of how incentive pay

could bring about effort. Expectancy theory provided the basis for this specification. It emphasised the role of subjectively held perceptions of the relationship between effort and extrinsic rewards[3] in determining effort. Testing the model and the hypotheses derived requires us to obtain measurements of the relationship subjects perceive to exist between effort and extrinsic rewards (pay and recognition). Eight items contained in the questionnare were designed with the intention of capturing dimensions of expectancy and instrumentality. These questions are listed in table 10.4.

[3] In our specification of the theory

Table 10.4
Expectancy Items

Question	Label
The success of my workplace depends on a special effort from its employees.	EXP_1
As an individual I can really make a difference to the success of my work team.	EXP_2
The way I do my job is very important for the quality of the work done in my work team.	EXP_3
As an individual I can really make a difference to the success of my department.	EXP_4
When I do a good job it gets noticed.	EXP_5
My company has an effective system to identify people for promotion.	EXP_6
The amount of the annual cash bonus depends a lot on how much effort employees put into their work.	EXP_7
The value of a share in Expamet depends a lot on the work effort of employees.	EXP_8

Many previous empirical studies have conflated dimensions of the perceived effort-reward link to form a single expectancy measure. Testing hypotheses *H1* to *H14*, however, to determine the optional structure of the model imposes a requirement for empirical proxies for both the expectancy (effort-performance) and instrumentality (performance-reward) dimensions of the relationship. Table 10.5 summarises the *a priori* division of

the items into expectancy or instrumentality dimensions, on the basis of the corresponding questions content.

Table 10.5
Expectancy Items:
Expectancy, Instrumentality Dimensions

Expectancy	Instrumentality
EXP_1	EXP_5
EXP_2	EXP_6
EXP_3	EXP_7
EXP_4	EXP_8

To investigate the appropriateness of this *a priori* division the items, with the exception of EXP_7 and EXP_8[4], were subjected to a principal components analysis. This showed that two common factors explained 60.4 per cent of the variance between the six variables. After a VARIMAX rotation, the variable loaded onto the two factors with the coefficients reported in table 10.6. By inspection, the pattern of these factor loadings corresponds with the *a priori* expected scheme of table 10.5.

[4] The reason for excluding EXP_7 and EXP_8 are discussed below.

Table 10.6
Expectancy Items: Factor Loadings

Item	Loading Coefficient	
	Factor 1	Factor 2
EXP_1	0.7876	0.0513
EXP_2	0.7467	0.1403
EXP_3	0.7138	0.0524
EXP_4	0.6311	0.1507
EXP_5	-0.0093	0.8862
EXP_6	0.2639	0.7901

Items within these two divisions were closely intercorrelated with the mean Pearson's r equal to 0.38 among items the *a priori* 'expectancy' group, and 0.46 for the 'instrumentality' group. In contrast the mean r was 0.17 between the items in both groups.

In the light of the correspondence between the behaviour of the items and the *a priori* scheme based on the questions' content, and supported by the strong intercorrelations of items within each group, regression-method factor scores were used to establish scales for factors 1 and 2, labelled E and I_1 respectively. Each varied about a mean of zero, with a standard deviation of one. Coefficients alpha reflected the strong internal consistency of the measures, and the 0.5 minimum requirement was comfortably exceeded with α equal to 0.71 and 0.63 respectively.

Cash Bonuses & Profit Sharing

While E and I_1 measures can be made for all members of the sample, items EXP_7 and EXP_8 apply only to subsamples: those covered by a cash bonus scheme, and employee shareholders respectively. The performance-related bonus and employee shareholdings increase the objective relationship between performance and pay for those employees covered by them. The *perception* that performance affects the size of the bonus or the value of shares is therefore an extra dimension of instrumentality applicable only to those covered by the respective schemes. The greater is the perceived link between performance and the size of the bonus or the value of shares, the greater is the instrumentality of performance for a particular employee. Accordingly EXP_7 and EXP_8 were recorded to form two possible increments in instrumentality for those covered by incentive pay schemes. EXP_7 was recoded to take the value one where the subject is (i) covered by a cash bonus scheme *and* (ii) perceives a positive link between the amount of the bonus and the work effort of employees,[5] and zero otherwise. This variable was labelled $I_{CB.}$ EXP_8 was recoded to take the value one where (i) the employee owned Expamet shares *and* (ii) the employee feels that the value of a share depends on a lot on the work effort of employees.[6] It took the value

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[5] That is if the rating is 1 or 2 on the Likert scale for EXP_7.

[6] That is if the rating is 1 or 2 on the Likert scale for EXP_8.

zero otherwise. This variable was labelled I_{SO}.

Four empirical proxies, E, I_1, I_{CB} and I_{SO} are therefore available as substitutes for the conceptual expectancy and instrumentality variables in the hypotheses to be tested.

10.5 Valence

Chapter Eight made the case that the usual means of operationalising valence for field tests of expectancy theory misrepresents the conceptual variable of the model. We argued that the empirical proxies used were based on an implicit assumption that the valence of pay is constant across increasing amounts of pay. The assumption was misleading, however: in a functioning pay system the anticipated satisfaction from pay is a *marginal* concept whose behaviour departs radically from the *ex ante* valence of the model. To test the validity of this argument hypotheses H_3, H_4, H_5 and H_6 were advanced as alternatives to the conventional approach. They required empirical proxies for the marginal valence of pay, and for the perceived level of pay received relative to that which would have been chosen.

Two items in the questionnaire corresponded in their content to this latter. They are listed as PAY_1 and PAY_2 in table 10.7. Pearson's coefficient or correlation between the two items was 0.87, significant at above the 99 per cent level.

We selected dimensions of valence to reflect its explicitly marginal nature in the context of a functioning pay system. To this end the importance attached to potential *increases* in pay was gauged. Three items in the questionnaire were thought to be at least partly representative of this. They are listed as $VALENCE_1$, $VALENCE_2$ and $VALENCE_3$ in table 10.7. The mean coefficient of correlation between the three items was 0.35, significant at above the 99 per cent level.

Table 10.7
Pay & Marginal Valence Items

Question	Label
I am well paid for what I do	PAY_1
I am satisfied with my basic pay	PAY_2
My company should increase the opportunities for paid overtime	$VALENCE_1$
Training should lead to an increase in wages	$VALENCE_2$
When new equipment is introduced workers' basic pay should be increased	$VALENCE_3$

The items were considered using regression-equivalent factor scores from a principal components analysis, and formed two scales, VALENCE and PAY. Each varied by a standard deviation of one about a mean of zero. The alpha coefficients for these scales indicated internal consistency of well above that of acceptability, at 0.61 and 0.93 for VALENCE and PAY respectively.

10.6 Individualism-Collectivism

In Chapter Seven we argued that the pretensions to universalism of neo-classical economic and expectancy theoretic models of incentive pay ignored the assumptions of calculative individualism on which they are predicated. We claimed that individualism was part of a value set of people which varies between people and overtime. Hofstede (1980) suggested that individualistic and collectivistic values were poles of a single continuum. Hence, to demonstrate that a person is characterised by a relatively collectivistic value set is to classify him as holding relatively individualistic values. Etzioni (1975) showed that high levels of individualism import a calculative disposition.

Testing hypotheses *H1* to *H14* requires us to develop an individualism-collectivism scale. Five items in the questionnaire tapped the relative collectivistic orientations of respondents, through opinions concerning trade unions, the principal agency for collectivism in the workplace, and, less specifically, reports of feeling part of an 'us and them' attitude. These items are listed as $COLLECT_1$ to $COLLECT_5$ in table 10.8.

Table 10.8
Individualism - Collectivism Items

Question[7]	Label
This is a 'them and us' relationship between department managers and all other levels of employees.	$COLLECT_1$
There is a 'them and us' relationship between very senior managers and all levels of employees.	$COLLECT_2$
Should your company have a trade union?	$COLLECT_3$
In general unions and their representatives should have more say in decisions affecting the company as a whole.	$COLLECT_4$
Local trade unions should have more power and influence in my company.	$COLLECT_5$

The correlations between each of the items were all significant at above the 99 per cent level, and so the five were entered into a principal components analysis. A single common factor was found to explain 44 per cent of the variance between the items. The items loaded onto this factor with the loading coefficients reported in table 10.9.

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[7] All responses are obtained on a 5 point Likert scale where

1 = strongly agree
2 = tend to agree
3 = neither agree nor disagree
4 = tend to disagree
5 = strongly disagree

except $COLLECT_3$ where 1 = Yes, 2 = No

Table 10.9
Collectivism - Individualism Items: Factor Loadings

Item	Loading Coefficient
$COLLECT_1$	0.5719
$COLLECT_2$	0.4704
$COLLECT_3$	0.5939
$COLLECT_4$	0.7943
$COLLECT_5$	0.8192

Regression method factor scores were used to construct a scale of the items, hereafter COLLECT, which varied with a standard deviation of one about a mean of zero. Coefficient alpha for COLLECT is 0.64 indicating that its internal consistency comfortably exceeds the minimum of 0.5 specified by Nunnally (1967).

10.7 Conclusion

We have established a set of empirical proxies for the conceptual variables in hypotheses *H1* to *H14*. The scales obtained are based on responses to the questions contained in the survey described in Chapter Nine. Nunnally (1967) suggested that a coefficient alpha value of 0.5 should be regarded as indicating sufficient external consistency for basic research. Each scale developed exceeds this, the minimum alpha for our set of scales being 0.61, and the mean alpha equal to 0.71. Thus we can say that the scales do meet the criterion of internal consistency.

The scales should also have external validity. The questions asked were designed in order to tap the particular concepts we consider, but another means to ensure external validity is to establish the consistency of the measures with others which aim to tap the same concepts. In this case a conformity of the results of using our empirical variables with those of previous operationalisations of expectancy-type models will tend to establish further the external consistency of our measures. Another means of establishing external consistency is the Friedman (1953) route of demonstrating the predictive power of the hypothesised measurement instruments. If using them permits useful hypotheses to be made which survive empirical falsification then we should not reject their use.

SECTION IV RESULTS

CHAPTER ELEVEN - RESULTS: MODEL STRUCTURE (VALENCE)

11.1 Introduction

In Chapter Eight we argued that the valence of pay was likely to be subject to diminishing returns: the more an employee had earned, relative to his target level of pay, the smaller would be his anticipated satisfaction from pay. The implication of this argument is that conventional tests of expectancy theory are mis-specified because they assume that field test recordings of valence are suitable empirical proxies for *ex ante* valence. This approach was made testable by the specification of hypotheses to compete with those implied by the conventional approach. Chapter Ten established scales to act as empirical proxies for the variables named in the hypotheses.

11.2 Valence and Expectancy/Instrumentality

Conventional tests of expectancy theory assume that measured valence and the effort-pay expectancy are independent. We have posited a competing set of hypotheses which states that the effort-pay expectancy (along with perceptions of pay) *determine* measured valence. Hence:

H3: Measurable valence will be high when expectancy and instrumentality are perceived as low and pay is perceived as low.

H4: Measurable valence will be low when pay is perceived

as high.

H5: Measurable valence will be low when expectancy and instrumentality are perceived as low.

Hypotheses *H3*, *H4* and *H5* predict that measured valence reports will fall into two separate groups:

when pay is thought low *and* the effort-pay expectancy is thought low, valence will be high;

otherwise, valence will be low.

Table 11.1 compares mean VALENCE levels for two groups formed by dichotomising the variables PAY, E and I at their medians. In addition, the second group is further disaggregated into its three component sub-groups in table 11.2.

Table 11.1

Measured Valence & low pay & expectancy perceptions

Groups	**N**	**mean VALENCE**	**(Std Dev)**	**t**
low E or I low pay	423	0.2161	(0.962)	
				5.71**
rest of sample	691	-0.1323	(1.000)	

* significant at >95 per cent
** significant at >99 per cent

The mean VALENCE of the low pay expectancy group was indeed significantly higher than that of the rest of the sample. We can reject with over 99 per cent confidence the proposition that in the population VALENCE is the same when expectancy and pay are low as for the remaining combinations of expectancy and pay perceptions.

What of the homogeneity of the 'rest of the sample' grouping? Table 11.2 disaggregates this group into its component parts, reporting the mean VALENCE for each. The table shows that the differences between the mean VALENCE reports for the three sub-groups are much smaller than that between them and the low pay - low expectancy group. None is significantly different from the remainder of the sample at the 99 per cent level.

Table 11.2

Rest of Sample: Measured Valence

Groups	N	mean VALENCE	(Std Dev)	t[1]
high E and I high pay	162	-0.1553	(1.071)	0.08
low E or I	266	0.0131	(0.860)	-2.60*
high E and I low pay	87	-0.1483	(1.042)	0.44

* significant at >95 per cent
** significant at >99 per cent

[1] t-statistic refers to difference of mean from mean of 'rest of sample' (reported in table 11.1)

Figure 11.1 Measured Valence and Pay Expectancy Perceptions

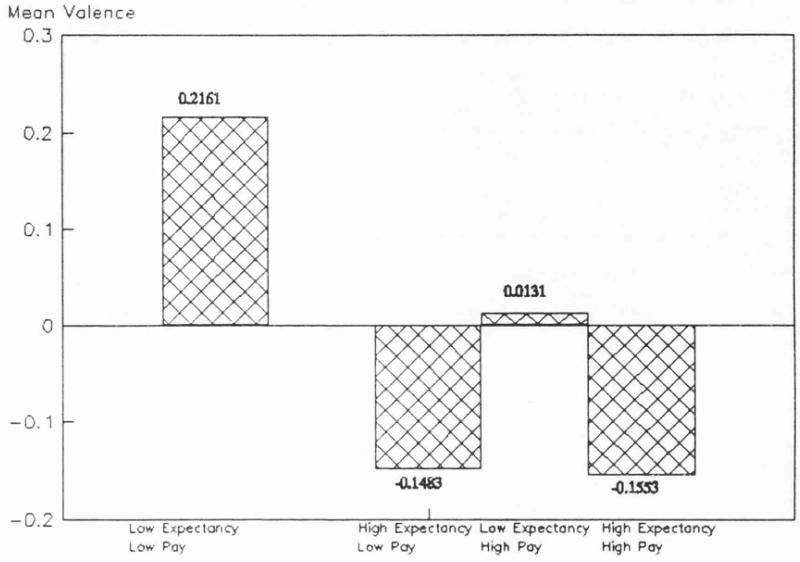


Figure 11.1 depicts graphically table 11.1. It confirms that when pay is thought to be low and the possibility of attaining more pay through higher effort is thought low, then measured valence is high. Hence measured valence is *not* independent of expectancy/instrumentality perceptions. This is in keeping with hypotheses *H3*, *H4* and *H5*.

11.3 Valence and Effort

Key to the conventional form of the expectancy model is the hypothesis that subject to positive expectancy-instrumentality perceptions being held, effort supplied varies positively with measured valence. The implication of our economic analysis in section 8.3, however, was that effort and measured valence were determined independently by factors which included

expectancy and instrumentality perceptions. According a negative association between effort and measured valence was predicted; hence hypothesis *H6* was advanced:

H6: Effort and measured valence will be negatively associated

Table 11.3

Measured Valence & Effort[1]

Crosstabulation

	High VALENCE	**Low VALENCE**
	%	%
High EFFORT	7.9	10.7
Low EFFORT	49.4	32.5

*Chi squared = 5.52** (N = 243, 1 degree of freedom)*

Correlation

Variables	**N**	**Pearson's *r***
VALENCE & EFFORT	243	-.2484**

** significant at >99 per cent

[1] for employees reporting high expectancy

Table 11.3 reports a marked negative association between effort and measured valence, as analyzed by dichotomising EFFORT and VALENCE into high and low groups at their respective medians. The Chi squared coefficient of 5.52 (with one degree of freedom) indicates that the association is significant in the direction predicted by hypothesis *H6* at a level of over 99 per cent. The coefficient of correlation of -0.25 between EFFORT and VALENCE, which is again significant at the 99 per cent level lends further support to hypothesis *H6*. Measured valence is demonstrably negatively associated with effort.

11.4 Other Empirical Studies

Many previous tests of expectancy theory in the field have included operationalisations of valence which measured valence *in the context* of an operating pay system and used it as a proxy for *ex ante* valence[1]. Such tests have revealed, in keeping with our suggestions, that valence has proved to be the most uncertain variable. Mitchell's (1974) review of the empirical literature concluded, "it appears as if weighting expectancies or instrumentalities by valences may not markedly increase the prediction of job effort. Since no-one has proposed formally an expectancy model without valence weights it is difficult to call this a competing theory. The issue is still without resolution as to the role of these weights."

[1] cf Peotich & Churchill (1981) for a survey.

Lawler & Suttle (1973) recorded that it was not clear whether the negative results [i.e. the insignificant role of valence in field tests] were due to problems with the measure or to the fact that valence does not influence effort as stated by expectancy theory.

The approach developed in Chapter Eight provided an explanation, theoretically-based, and which was supported by the empirical tests which we have reported above. Other empirical studies also provide evidence for the particular predictions of this approach.

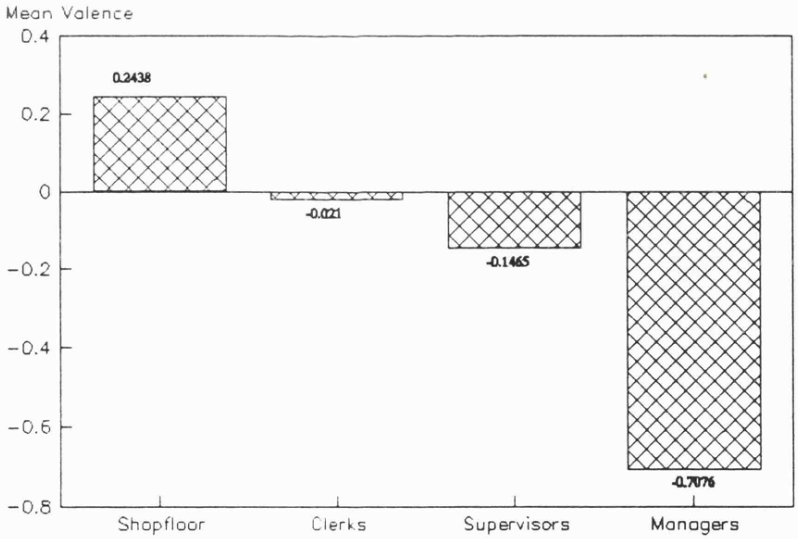
For example Oliver (1974) in a field study of insurance agents working under a bonus system scored the measured valence of pay on a six point desirable-undesirable range. He found:

> (i) that measured valence was not a significant determinant of performance (our *H6* posited that it was merely a covariate);
>
> (ii) that measured valence was highly correlated with the effort-pay expectancy (our *H3*, *H4* and *H5* predicted that measured valence was partially determined by this expectancy).

Oliver's results support precisely the predictions of our hypotheses.

Lawler (1971) observed that "a good deal of evidence shows that as one considers higher and higher levels within an organization, pay becomes less important." This phenomenon Lawler does not explain. It can, however, be seen to support our thesis that measured valence is not constant but declines as pay is accumulated (subject to the plausible assumption that higher positions bring with them more pay).[2] This is borne out in our own sample: figure 11.2 shows that the mean measured valence of pay declines for higher positions in the corporate hierarchy.

Figure 11.2 Measured Valence and Position in Company



[2] Managerial positions in the companies surveyed are indeed better paid than other levels. Hypothesis *H4* predicts that measured valence will be low for such a group, which proves to be the case.

11.5 Conclusion

Empirical evidence presented here has supported our contention that field tests of expectancy theory are mis-specified when they include a proxy for valence which is measured in the context of the functioning pay system. We have demonstrated that the behaviour expected from such an operationalisation differs markedly from that implied by the orthodox expectancy model. Accordingly, making use of such proxies introduces unexplained variation into the model and should be avoided. Until an adequate proxy for *ex ante* valence can be developed, cross-sectional field tests should not weights expectancies and instrumentalities by measured valence.

As Mitchell has pointed out, doing so does not seriously disturb predictive power. Accordingly the expectancy model will be specified excluding the measured valence variable.

CHAPTER TWELVE - RESULTS: MODEL STRUCTURE (OPTIMIZATION)

12.1 Introduction

In Chapter Six we argued that the assumption of optimization underlying neo-classical economics and expectancy theory was over-restrictive. In practice peoples' computational abilities were insufficient to replicate strict optimization, so that less rigorous means of combining relevant variables were used. This conjecture made the orthodox postulate, that expectancy and instrumentality must be *multiplicatively* combined, questionable in its usefulness: by following the Popperian prescription of altering the specification of the model to correspond more closely to what is known about the decision-making process, we may enhance the predictive power of the model. In Chapter Eight we derived a set of hypotheses summarising these alternative positions. Chapter Ten compiled a set of empirical proxies advanced as being suitable for testing the hypotheses. In this chapter we test the hypotheses to determine whether the strict multiplicative or non-multiplicative specification of the model is more appropriate.

In the past only a small number of direct comparisons of multiplicative and non-multiplicative forms have been made. Yet the form of the model reflects a fundamental theoretical assumption of economic rationality. This Chapter will show that the non-multiplicative expectancy model carries

significally greater explanatory power than the orthodox approach. This supports our hypothesis that global economic rationality does not always characterise human decision-making. Prescriptive models of incentive pay should recognise this in their assumptions made.

12.2 Testing the Multiplicative Specification

The standard expectancy model which we have hypothesised is of the form:

$$W = E.I \qquad 4$$

where W = effort
E = expectancy
I = instrumentality

Hypothesis *H7* and Hypothesis *H8* postulated:

H7: *Expectancy and instrumentality predict a significant proportion of effort*

H8: *The interaction of expectancy and instrumentality is a significant predictor of effort*

To test these hypotheses we operationalised equation *4* by estimating it as an Ordinary Least Squares (OLS) regression

equation with the empirical proxies for W, E and I taking the place of the conceptual variables. The independent variables were dichotomised at their medians to denote 'high' and 'low' levels of expectancy and instrumentality.

12.3 Results: Multiplicative Specification

The results of the OLS regression estimation of equation *4* are reported in table 12.1. Dummy variables representing high and low expectancy and instrumentality explain, when combined multiplicatively, around 18 per cent of the variability of EFFORT across the sample of 979 employees from whom valid responses were obtained. The estimated equation has an F statistic of 221.4, indicating that we can reject with over 99 per cent confidence the possibility that there is no relationship between the independent variables and EFFORT in the population from which the sample is drawn. The interaction of E1 and I1 is highly significant, with a *t*-statistic of 14.9, significant at over 99 per cent.

Table 12.1

Model Specification: The Multiplicative Form

Dependent Variable: EFFORT

Independent Variable[1]	B	(Std Error)	β	t
EI	0.9815	(0.0660)	.4296	14.88**
(constant)	-0.2425	(0.0334)		7.26**

Adjusted R^2 = 0.1837

F (1,978) = 221.4

[$F_{0.01(1,978)}$ = 6.70]

** significant at over 99 per cent

Table 12.1 provides empirical support to hypothesis *H7*: expectancy and instrumentality exhibit a significant association with effort. The results also offer preliminary support for hypothesis *H8*: the interaction term, EI, which proxies the *multiplicative* combination of expectancy and instrumentality proves highly significant in explaining EFFORT.

---

[1] Empirical proxies represent:

EFFORT	*employee effort*
E1	*expectancy (*E *dichotomised at median)*
I1	*instrumentality (*I *dichotomised at median)*
EI	*interaction of expectancy and instrumentality (*E1 *multiplied by* I1*)*

Table 12.2 summarises the predictive power of previous operationalisations of the multiplicative expectancy model. It is noteworthy that the R^2 statistic for our test compares favourably with those resulting from other empirical studies.

Table 12.2

Model Specification: The Multiplicative Form - Comparison of R^2

Test	R^2	N
(Table *12.1*)	0.1837	979
Schwab *et al*.	0.1369	29 published tests

In a survey of the predictive power of multiplicative expectancy models, Schwab *et al* (1979) reported an average R^2 of 0.1369 for 29 published studies using, like us, effort self-reports as the dependent variable. This is broadly in line with the R^2 of 0.1837 reported in table 12.1. Table 12.2 confirms, therefore, that our measurement instruments perform as proxies for expectancy theory variables at least as well as those previously employed.

The fact that our instruments yield similar results to studies using different tools lends credence to the underlying validity of the expectancy approach: it is supported over a range of measurement instruments designed to test it. In addition, the conformity of our results with those of previous

tests lends confidence to the empirical proxies constructed in Chapter Ten and used in the above test.

However, in common with previous tests, our operationalisation of the expectancy model leaves a substantial proportion of variability in effort reports unaccounted for: over 82 per cent, as reported by table 12.1. While variation between people is to be expected in cross sectional analysis, it is nevertheless the case that the greater the predictive power of the model, the more confidence practitioners can have in its prescriptions for the design of pay systems.

12.4 Testing the Non-Multiplicative Specification

In their review of empirical tests of multiplicative expectancy models reported above, Schwab *et al* (1979) admitted to "a nagging suspicion that expectancy theory over-intellectualises the cognitive processes people go through when choosing between alternative actions." Chapter Eight advanced a rationale, based on behaviourial analysis of decision process, for departing from the strict global rationality underlying traditional expectancy theory. Can an expectancy-type model which departs from the strict multiplicative specification better explain effort in practice? Hypothesis H9 was advanced as an alternative to H8. H9 states:

H9: *Non-multiplicative combinations of expectancy and instrumentality predict a greater proportion of effort than does a multiplicative combination.*

In place of equation *4*, the particular functional form is left open, hence

$$W = f\ (E,\ I) \qquad 5$$

is proposed.

12.5 Results: Non-Multiplicative Specification

Using the empirical proxies developed in Chapter Ten, the dependent variable EFFORT, and independent variables E1, I1 and EI were subjected to a stepwise hierarchical OLS regression analysis with P(E)>.95 as the criterion for entry into the OLS equation. Table 12.3 summarises the results of this stepwise regression. E1 and I1 represent the expectancy and instrumentality proxies dichotomised into high and low groups at the median. EI represents the interaction between these terms.

Table 12.3

Non-Multiplicative Specification

Dependent Variable: EFFORT

Step	Independent Variable[2]	Adjusted R^2	β	t
1	E1	0.2429	0.4936	17.75**
2	I1	0.2898	0.2180	8.09**
Not Selected	EI	0.0641	1.36	

N= 979

Table 12.3 shows that a non-multiplicative specification of the expectancy model fits the sample data better than a multiplicative specification. While both the expectancy and instrumentality variables entered the equation significantly (and were significant at more than 99 per cent confidence), the interaction terms EI did not attain a level of significance to justify its inclusion. The F-statistic of the equation after stage 2 of the stepwise analysis was 200.7, suggesting that we can reject with over 99 per cent confidence

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[2] Empirical proxies represent:

EFFORT *employee effort*
E1 *expectancy (*E *dichotomised at median)*
I1 *instrumentality (*I *dichotomised at median)*
EI *interaction of expectancy and instrumentality (*E1 *multiplied by* I1*)*

the proposition that the population *Beta* coefficients are equal to zero. The equation explains almost 30 per cent of the variance of the effort reports of 979 employees, an increase of over 10 per cent on the proportion explained by the multiplicative specification. This increase in predictive power is significant at the 99 per cent level.

Table 12.4 summarises the increase in R^2 associated with the non-multiplicative model.

Table 12.4

Multiplicative Vs Non-Multiplicative Forms

Specification	R^2	ΔR^2
multiplicative	0.1837**	*+0.1061***
open	0.2898**	

** significant at >99 per cent

Accordingly the evidence summarised in table 12.4 leads us to prefer hypothesis *H9* to *H8*: a strictly multiplicative specification of the expectancy model circumscribes its predictive power.

12.6 Implications of results

That an additive model of effort and expectancy and

instrumentality has greater explanatory power than a multiplicative model has important implications. It reports that even when subjects feel that the link between performance and extrinsic rewards is tenuous, they will still tend to supply higher effort if they feel that they can influence their own performance by so doing. Conversely, a perception that affecting measured performance through personal effort is uncertain will not prevent a worker supplying high levels of effort if he feels that there is a pronounced relationship between performance and rewards.

These results argue against a narrowly rationalistic conception of human decision making, and resonate with behaviourial models discussed earlier. If assessing the interaction effects of expectancy and instrumentality is more mentally demanding than considering each variable in isolation, then the additive model found to fit best accords with Leibenstein's (1976) view that humans dislike the first mode of calculation and therefore avoid it. Similarly the findings accord with Simon's theory of bounded rationality, in which the full consequences of a decision on other variables (ie their interaction) are not consistently assessed.

Mitchell (1982, p359) concludes that "people do not compute probabilities and values, multiply them together, add the products, and base their choice on these computations. It is far too taxing and complex a process." This necessitated "questioning some basic theoretical assumptions inherent in

expected value formulations."

So much is not in doubt: the underlying assumptions of *Rational Economic Man* are frequently departed from in practice. Chapter Six referred to the substantial theoretical literature establishing reasons for this. Nevertheless, the tenacity of the approaches founded on *Rational Economic Man* assumptions derives from its demonstrated usefulness in prediction. For it to be departed from an alternative must be advanced which improves the explanatory and predictive power of the models which incorporate it. Table 12.4 provides evidence, from a particularly large and broad sample, that this is the case in the context of effort and pay.

Previous attempts have been made to determine the appropriateness of the optimizing assumption of rational economic man reflected in the multiplicative form. However, as Schwab et al (1970) point out, only a small number of direct comparisons of multiplicative and additive models have been made. Those which have[3] report mixed findings, and none was made outside the United States. The increasing incidence of incentive pay in Britain in recent years makes it necessary to consider the applicability of its theoretical underpinnings. Evidence from our sample suggests that a non-multiplicative expectancy model has greater explanatory power than the orthodox interaction model.

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[3] eg Schwab & Dyer (1973), Lawler & Suttle (1973), Behling et al (1978)

12.7 Direction of Causality

Given that our sample in cross-sectional rather than time-series, the test results reported have a correlational rather than causal status. As such it could be argued that the causality which we hypothesise, running from expectancy and instrumentality perceptions to effort, does not hold: rather that reports of effort supplied form the basis of the subject's report of his expectancy and instrumentality perceptions.

As a cross-sectional study the possibility of such reversed causality cannot be completely refuted. However, confidence in the causality for which we argue is substantially supported by the results reported in table 12.2. Table 12.2 establishes a consistency between our findings and the body of previous evidence relating to expectancy models. Since this body of evidence includes time-series as well as cross-sectional tests, the causal role of expectancy and instrumentality in determining effort in our sample can be inferred.

CHAPTER THIRTEEN - RESULTS: BOUNDARY CONDITION (INDIVIDUALISM)

13.1 Introduction

Chapter Seven was concerned with the boundary conditions of neo-classical models of incentive pay. It argued that, being predicated on a value set of calculative individualism, the models would be powerful predictors of behaviour among people whose values corresponded to those implicitly assumed. Where such values did not apply substantial predictive power was not to be expected from the models. A set of hypotheses representing this argument was advanced: hypotheses which we subject to empirical scrutiny in this chapter.

The results which we report show that the power of our incentive model was significantly greater among relatively individualistic employees than among their collectivistic colleagues. In OLS regression specifications of the model, 37.1 per cent of variation in individualists' effort was explained by the model, compared with 17.9 per cent among collectivistic employees.

These findings were robust to situational influences, such as the employees' position in the company, age and level of education. The model was markedly more successful in predicting the effort supplied by individualistic managers, for example, than among collectivistic managers. The importance of values as a boundary condition seems not to be

a result of the construct being a covariate of other, situational variables. We therefore conclude that the values axis has an important role in delineating the power of our incentive model.

13.2 Consistent Values & Incentive Pay

Hypothesis *H10* stated:

> *H10: The predictive power of the model will be greater among employees of relatively individualistic value sets than among employees of relatively collectivistic value sets.*

In the light of the findings of Chapters Eleven and Twelve, we test this hypothesis using the non-multiplicative structure of the model.

The most commonly used indicator of the predictive power of a model specified in Ordinary Least Squares (OLS) multiple regression form is R^2, the Coefficient of Determination of the estimated form. R^2 indicates the proportion of variance of the dependent variable in the sample which is explained by the model. To the extent that the sample is representative of the population, the R^2 coefficient is an estimator of the model's ability to predict the value of the dependent variable in the

population.[1]

In order to distinguish members of the sample of relatively individualistic values (and therefore, after Etzioni (1975), relatively calculative values) from those of relatively collectivistic values, each case was allocated to one of two equal groups (each N=409) according to whether its COLLECT score was above the median (forming a group labelled 'high COLLECT') or below the median (to form a group labelled 'low COLLECT'). Separate regression equations were estimated for each group, and the structure and predictive power of the best fitting form were compared.[2]

13.3 Individualistic values: Results

Table 13.1 reports the results of estimating equation *5* as a stepwise, hierarchical regression equation among members of the sample classified as being of a relatively individualistic

---

[1] Since the best-fitting equation is estimated for the particular sample in question, the Coefficient of Determination is usually interpreted as indicating the *maximum* predictive power the model will have if applied to the population.

[2] An apparently obvious method of determining the importance of collectivistic-individualistic values would be to include the empirical variable COLLECT as another independent variable in the regression equation, and assess its contribution by applying the equation to the *whole* sample. This method, however, would assess the effect of the collectivistic-individualistic value axis on EFFORT directly. It would *not* indicate the differences in the predictive power of the *model* (which is advanced as being comprehensive and universal) between subjects of differing values sets. Since our purpose is to investigate a possible boundary condition of certain incentive models, the direct effects of values on effort are outside the focus of our analysis.

value set.

Table 13.1

Predictive Power: Individualistic Values

Dependent variable: EFFORT

Stepwise Entry

Step	Independent Variable[3]	Adjusted R^2	β	t
1	E1	0.3209	0.5680	13.68**
2	I_{CB}	0.3439	0.1583	3.85**
3	I1	0.3611	0.1373	3.40**
4	I_{SO}	0.3712	0.1100	2.70**

Best Fitting Equation

Independent Variable	B	(Std Error)	β	t
E1	0.9946	(0.0788)	0.5187	12.61**
I_{CB}	0.3490	(0.0985)	0.1433	3.54**
I1	0.2677	(0.0769)	0.1396	3.48**
I_{SO}	0.2226	(0.0826)	0.100	2.70**

Adjusted R^2 = 0.3712 F (4,390) = 59.14

[$F_{(0.01)}$ (4,390) = 3.4]

** significant at above 99 per cent

---

[3] Empirical proxies represent:

EFFORT	*employee effort*
E1	*expectancy (E dichotomised at median)*
I1	*instrumentality (I dichotomised at median)*
I_{CB}	*additional instrumentality associated with bonus*
I_{SO}	*additional instrumentality associated with owning shares in company*

R^2 for subjects of individualistic values was 0.3719, indicating that the model explained nearly forty per cent of the variation in EFFORT for these employees. This figure is significantly higher than that for the whole sample undifferentiated by their value set: there the model explained only 28.9 per cent of EFFORT[4].

The results contained in Table 13.1 show that our incentive model explains a significant proportion of the effort of individualistic employees. For Hypothesis *H10* to be supported we should expect that among relatively collectivistic employees, the explanatory power of the model will be lower, thus highlighting the importance of the assumed value set. Section 13.4 assesses the power of the model among relatively collectivistic employees.

13.4 Collectivistic Values: Results

Table 13.2 reports the results of estimating equation *5* as a stepwise, hierarchical regression equation among members of the sample classified as being of a relatively collectivistic value set.

[4] Reported in table 12.3.

Table 13.2

Predictive Power: Collectivistic Values

Dependent variable: EFFORT

Stepwise Entry

Step	Independent Variable[5]	Adjusted R^2	β	t
1	E1	0.1432	0.3812	8.24**
2	I1	0.1690	0.1676	3.66**
3	I_{SO}	0.1786	0.1786	2.38*

Best Fitting Equation

Independent Variable	B	(Std Error)	β	t
E1	0.7208	(0.0867)	0.3819	8.31**
I1	0.3070	(0.0910)	0.1547	3.38**
I_{SO}	0.2166	(0.0911)	0.1093	2.38*
(constant)	-0.8508	(0.0706)		-12.05**

Adjusted R^2 = 0.1786 F(3,397) = 30.0

[F(0.01) (3,397) = 3.7]

* significant at above 99 per cent
** significant at above 95 per cent

The predictive power of the model applied to employees of relatively collectivistic values was considerably lower than that for the group of employees of relatively individualistic

---

[5] Empirical proxies represent:

EFFORT	*employee effort*
E1	*expectancy (E dichotomised at median)*
I1	*instrumentality (I dichotomised at median)*
I_{SO}	*additional instrumentality associated with owning shares in company*

values, and also for the sample as a whole. The Coefficient of Determination (R^2) for the best-fitting equation indicated that the model explained 17.9 per cent of the EFFORT of collectivistic employees. This compared with 37.1 per cent for individualistic employees and 28.9 per cent for the sample as a whole.

13.5 Summary: The Boundary Condition and Predictive Power

Hypothesis *H10* claimed that the predictive power of the model would be greater among individualistic subjects than among collectivistic employees. Using R^2, the Coefficient of Determination of the regression equation, as an indicator of predictive power, table 13.3 and figure 13.1 summarise the evidence pertinent to testing *H10*.

Table 13.3: Power of the Model by Values

Group	**N**[6]	**Adjusted R^2**
collectivistic employees[7]	400	0.1786
individualistic employees[8]	394	0.3712
Whole sample[9]	*979*	*0.2898*

[6] Missing values among one or more of the items in the scales account for the number in the two sub-samples not summing to the number of cases in the whole sample.

[7] Results from table 13.2.

[8] Results from table 13.1.

[9] Results from table 12.3.

Figure 13.1 Predictive power of the Model by Values

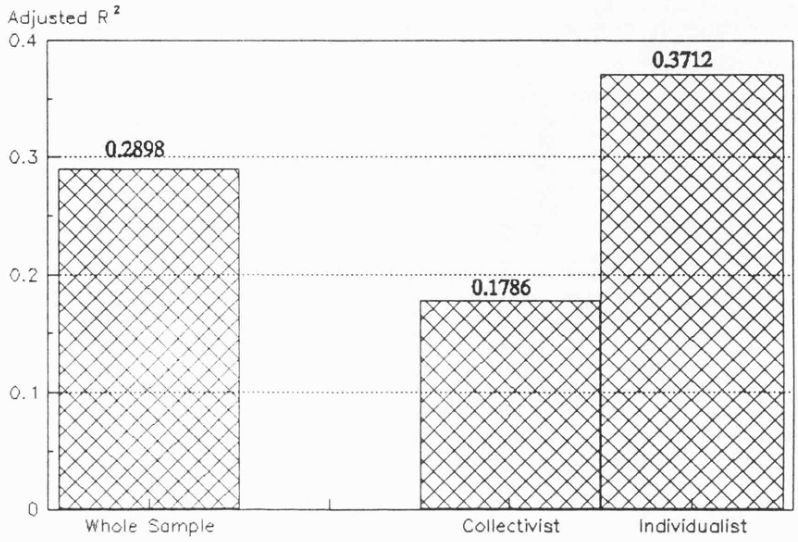


Table 13.3 and figure 13.1 show that the model explains over 37 per cent of the variation in effort reports of employees of relatively individualistic value sets, compared with less than 18 per cent for relatively collectivistic subjects. This constitutes striking evidence in support of hypothesis *H10*. The model is considerably more successful in its predictive power for individualists than it is for collectivistic employees. In addition, a significant advance in the model's power is made by respecting the boundary condition of individualism rather than applying it without regard to values. Therefore we can say that models which are tested over undifferentiated samples risk mis-stating their true power: in certain circumstances the models are effective frameworks in which to predict effort, in others they are

considerably less powerful. Moreover these circumstances can be identified with the extent to which the values of subjects are consistent with the underlying assumptions concerning them which are made in expectancy theoretic, and other neo-classical models.

13.6 Discussion: Structure

A comparison of tables 13.1 and 13.2 reveals a number of important differences in the structure of the best-fitting regression equations between the relatively collectivistic and individualistic groups.

While E1, the expectancy that individual effort affects performance, is a significant determinant of effort supplied for both sub-samples, its influence is greatest amongst employees of individualistic values: its beta coefficient is 0.52 compared with 0.38 for the collectivistic group. This implies that the relationship between individual effort and measured performance, one of the key dimensions of the expectancy model of incentive pay, and the neo-classical economic model (in representing potential for free-riding (cf Section 5.7), is more important in determining effort among individualistic than collectivistic employees.

The second principal difference in the structure of the two equations is that, while share ownership was significant in both sub-samples (with similar beta coefficients), the

instrumentality of the cash bonus was a significant determinant of effort only for relatively individualistic employees. For this group it was more important in determining effort than the share-ownership instrumentality. On *objective* grounds the perception that the reward (share price growth or size of bonus) depends on performance should be lower for share ownership than for the cash bonus since the bonus always refers to a group smaller than that of the listed company. This is borne out in the individualistic sub-sample, but among collectivistic employees the role of the instrumentality of share ownership is significant in determining effort while that of the cash bonus is not. Thus, collectivistic subjects are motivated by the more collective benefits, while individualists recognise that free-riding is less a problem in the cash bonus than share-ownership.

13.7 Values and Situational Variables

A potentially important objection to our analysis is that the values variables which we have employed are no more than covariates of other, more important variables which we have omitted from our analysis. In consequence the results reflect not the role of values, but these other omitted variables.

In Chapter Seven we identified two sources of peoples' value orientations: innate dispositions, acquired either genetically or in the subjects formative years; and internalised social norms.

It is consistent with this twin conception of values that other, situational variables may shape a subject's values and hence his behaviour. Managers may express themselves as individualists because their job requires individualistic behaviour. Shopfloor work may tend to be more team-based and mould a value set which is predominately collective. Years in education may have inculcated a set of individualistic values in some employees at the expense of a collectivistic orientation which may have resulted from starting work at the age of fifteen.

Since we have assumed that values may be shaped by the internalisation of social norms we concede, and indeed expect, that such factors as position in the work hierarchy will shape a person's values. Accordingly we need some criterion for judging whether it is not more useful to examine the influence of position in the company on behaviour directly rather than to do so through values. The criterion which we adopt is to retain the values discriminator if it contributes to predictive power over and above that conveyed by deferring to a set of situational variables thought to determine values.

Accordingly respondents' position in the organization, age, gender and level of education attained were examined in two ways.

Firstly, if the values axis were no more than a *covariate* of these situational variables, then segmenting the sample by

these variables directly should be a more accurate means of specifying the model's boundary conditions that referring to values. Thus the model's predictive power should be more polarised if the sample were segmented by these situational variables. If, on the other hand, the values axis carries explanatory power over and above that given by situational variables, the polarisation of predictive power should be greater for these segmentation according to the presence of individualistic or collectivistic values.

Secondly, if situational variables convey the majority of information summarised in the values axis, then having segmented the sample by reference to these variables, the values dimension should contain little discriminatory power within the sub groups. Figures 13.2 to 13.5 assess these expectations

13.7a Position in Company

Figure 13.2a Predictive power of Model by Position in Company

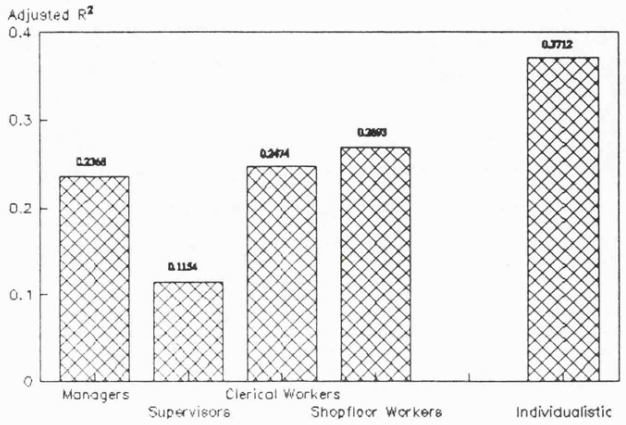


Figure 13.2a shows that limiting the ambit of the model to subjects of four occupational levels does not result in its predictive power attaining the level (R^2 = 0.37) achieved by segmenting the sample according to the collectivistic individualistic value dimension.

Figure 13.2b Difference in R^2 Associated with Individualistic/Collectivistic Values

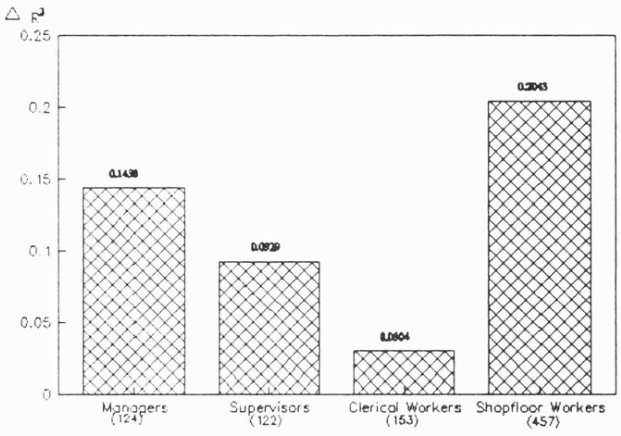


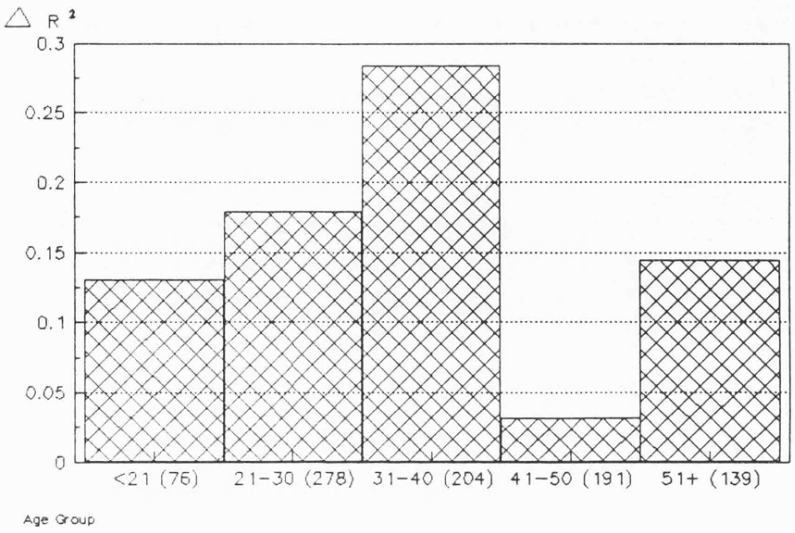
Figure 13.2b shows that the presence or absence of individualistic values has a powerful discriminating role in assessing the fit of the model. In each division of the sample, further restricting the domain to subjects of relatively individualistic value sets increases the R^2 above that which results when applying the model to the more collectivistic employees in the grouping.

13.7b Age

As figure 13.3a illustrates, the model's fit is not improved by restricting its application to employees of particular age groups, rather than of a particular value set.

Moreover, within each one of the five age groups, introducing the collective values dimension as a boundary condition continues to lead to sharp polarisations in the model's predictive power. In the 21 to 30 year old group, for example, the coefficient of determination is 0.33 when the model is estimated for relatively individualistic employees, and only 0.16 when applied to relatively individualistic employees.

Figure 13.3 Difference in R^2 Associated with Individualistic/Collectivistic Values



13.7c Educational Level

In order to assess the role of the level of education attained as a more powerful means of describing the boundary condition of the model, the questionnaire supplied us with the age at which respondents left full time education as the closest proxy. The sample was therefore divided into three groups: those leaving school below 17 years of age (as a proxy for employees educated up to secondary level); those leaving education between the ages of 17 and 19 inclusive (approximately to A-level or equivalent employees); and those leaving education at the age of twenty or above (approximately to higher or further educated workers).

Figure 13.4a Predictive Power of the Model by Level of Education

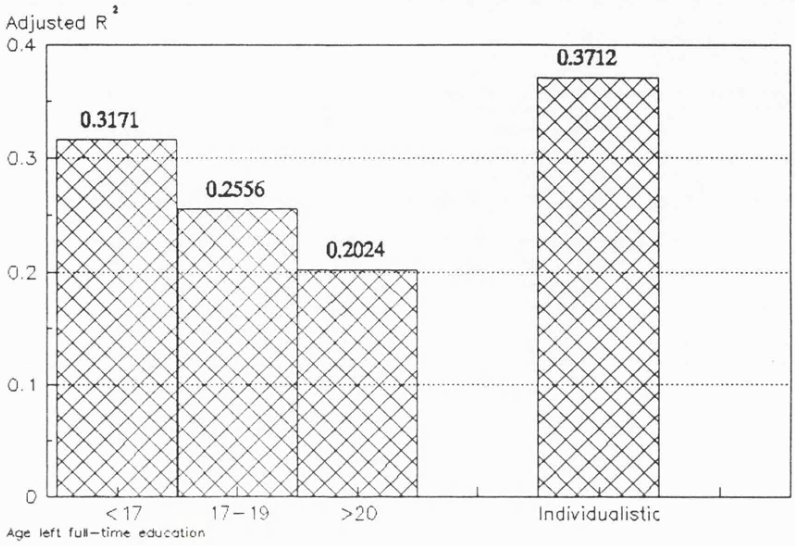
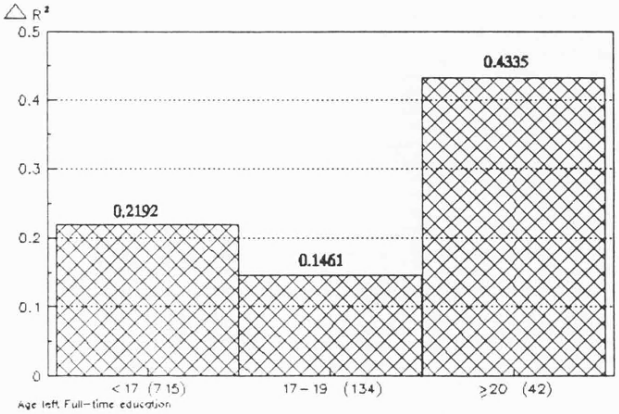


Figure 13.4a shows that dividing the sample in this way is not as successful in specifying employees for whom the model has greatest predictive power as referring to the individualistic values dimension. Further, figure 13.4b demonstrates that within each educational group, discriminating by individualism leads to substantial differences in the predictive power of the model.

Figure 13.4b Difference in R^2 Associated with Individualistic/Collectivistic Values



13.7d Gender

Dividing the sample into male and female groups (figure 13.5a) showed that the model was more powerful amongst male respondents than among women. Within both groups, however, predictive power could be polarised further by taking into account whether the respondent fell into the relatively individualistic or collectivistic category, (figure 13.3b)

Figure 13.5a Predictive power of the Model by Gender

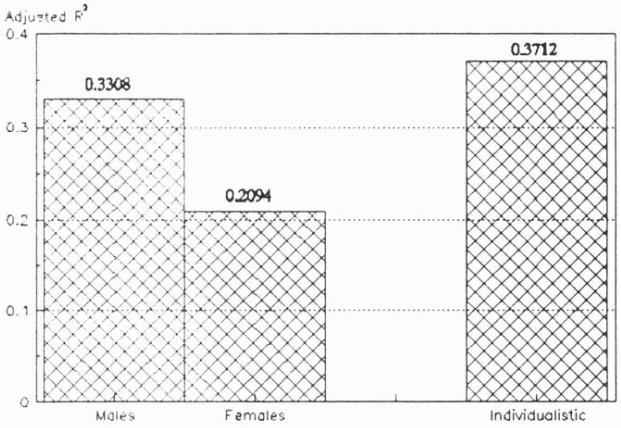
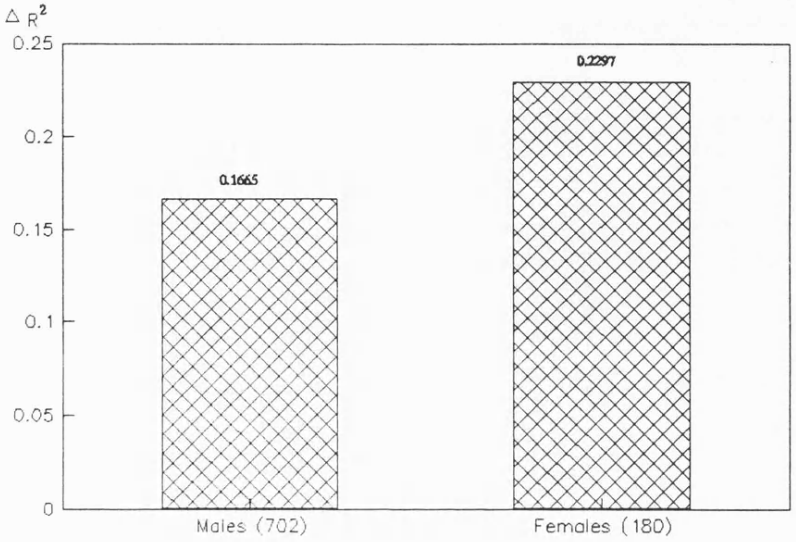


Figure 13.5b Difference in R^2 Associated with Individualistic/Collectivistic Values



13.7e Conclusion

Figures 13.2 to 13.5 show very clearly that the appropriateness of the incentive model to relatively individualistic employees is not undercut by taking account of their gender, age, educational level or position in the company. Rather the values dimension emerges with its usefulness as a *parsimonious* and powerful discriminator confirmed. Within each situational group, taking account of the relative individualism of subjects allowed their behaviour to be predicted more accurately.

The results reported showed that the model fitted best employees who were male, completed secondary education only

and were aged between 31 and 50. Among subjects who displayed *all* of these characteristics, the model explained 34 per cent of the variation in effort reports.

This is significantly less than the equivalent figure of 37 per cent achieved among the employees selected according to only *one* criterion: their relative individualism. The values axis meets the criterion combining power with parsimony. While the individualistic collectivistic value set may be moulded by a host of factors it is clear that it constitutes an important axis of discrimination over and above particular situational effects.

CHAPTER FOURTEEN - RESULTS: CASH BONUS, SHARE OWNERSHIP & VALUES

14.1 Introduction

We have argued that incentive-based payment systems tend to be advocated based on assumptions which do not universally hold. In particular we have demonstrated that the expectancy-view of motivated behaviour is a powerful predictive model against subjects of individualistic value sets, and much less powerful for relatively collectivistic employees.

It follows from this that incentive-based payment systems will be effective in increasing effort to the extent that they succeed in raising the expectancy/instrumentality perceptions of employees, and to the extent that employees are individualistic in their values.

Since cash bonuses and share ownership *objectively* enhance the contingency between performance and rewards, then insofar as the instrumentality perception reflects to some extent the objective situation, according to our incentive model cash bonuses and employee share-ownership will be associated with higher levels of effort among employees who are covered by these schemes than among those excluded. Because cash bonuses always refer to a smaller set of sharers than share ownership (so, after the economic analysis, the potential for free-riding is lower), the objective instrumentality is higher for

cash bonuses than share ownership. Accordingly we would expect the cash bonus to motivate higher effort levels than share ownership.

However, the previous results have given strong support to our hypothesis that the incentive model is most appropriately applied to employees of relatively individualistic value sets. In the light of these findings, we expect to find that cash bonuses and employee shareholdings will be associated with higher effort among *individualistic* members of the sample who are covered by the scheme than among similar employees not included. At the same time we expect to find *no significant difference* between the effort supplied by collectivistic subjects divided according to whether or not they are covered by an incentive scheme. Hypotheses *H13* and *H14* summarised this view:

> *H13: employees (i) covered by an incentive pay contract and (ii) who hold a relatively individualistic value set will supply relatively high levels of effort.*

> *H14: employees (i) covered by an incentive pay contract and (ii) who hold a relatively collectivistic value set will supply no more effort than employees not covered by incentive pay.*

Testing these hypotheses resulted in striking evidence which supported our proposition that individualism among employees

is an important condition to be met if incentive pay is to motivate effort at work. Effort supplied by individualistic employees incentivated by a cash bonus was significantly greater than individualists without a cash incentive. In contrast there was no significant difference between the effort supplied by collectivistic people covered by a bonus and those without this supposed incentive. Equally, while individualists who owned shares in their company supplied significantly greater effort than employees of similar values without shareholdings. In contrast share-ownership made no significant difference to the effort supplied by relatively collectivistic employees.

These results suggest that incentive pay programmes should be restricted to individualistic employees if they are to result in significant increases in effort.

14.2 Results: Effects of cash bonus by values

To test these hypotheses the sample was, as in Chapter Thirteen, divided into relatively collectivistic and relatively individualistic groups by referring to whether a case lay above or below the median value of the COLLECT scale. This had the effect of controlling for the direct effects of the values set on effort supplied. Within each group the mean effort level was obtained for (i) employees covered by a cash bonus scheme (ii) employees not covered by a cash bonus scheme (iii) employees who own shares in Expamet and (iv) employees

who do not own shares in Expamet.

For hypothesis *H13* to be supported, we would expect that the incidence of an incentive scheme is associated with a significantly higher level of effort supplied among *individualistic* employees. For hypothesis *H14* to be supported there should be no higher effort associated with the incidence of an incentive scheme among *collectivistic* subjects. In addition we would expect the effort associated with a cash bonus scheme among subjects of a congruent value set (ie individualistic) will be higher than that prevailing under share ownership, with its more diluted incentives.

Table 14.1
Cash Bonus & Effort Reported

Group	N	mean EFFORT	(std dev)	*t*
INDIVIDUALISTIC EMPLOYEES				
(i) no cash bonus	300	0.2517	(0.954)	3.61**
(ii) cash bonus	117	0.6161	(0.850)	
COLLECTIVISTIC EMPLOYEES				
(i) no cash bonus	357	-0.3793	(0.975)	1.03
(ii) cash bonus	60	-0.2439	(0.936)	

** significant at over 99 per cent

Table 14.1 reports the results of an analysis of the effect of cash bonuses on collectivistic and individualistic employees. Among individualistic employees the presence of the cash bonus

scheme is associated with a substantially higher level of effort supplied. We can claim, with over 99 per cent confidence, that individualists under a cash bonus system work harder than similar employees not covered by this scheme. This results lends empirical support to hypothesis *H13*. Amongst *collectivistic* employees, however, the presence of a cash bonus incentive scheme is not associated with significantly higher effort than amongst similar employees who are not covered by the scheme. This result offers clear support for Hypothesis *H14*.

14.3 Results: Effects of share ownership by values

Table 14.2:
Employee share-ownership & Effort Reported

Group	N	mean EFFORT	(std dev)	*t*
INDIVIDUALISTIC EMPLOYEES				
(i) no shares	223	0.2206	(0.949)	3.03**
(ii) share owners	194	0.5006	(0.932)	
COLLECTIVISTIC EMPLOYEES				
(i) no shares	187	-0.4665	(0.929)	1.82
(ii) share owners	237	-0.2989	(0.948)	

** significant at over 99 per cent

Table 14.2 tells a similar tale. Share ownership made no significant difference to the effort supplied by relatively collectivistic employees. However, we can be over 99 per cent confident that among individualists, owning shares in Expamet

was associated with greater effort being supplied. These results further support hypotheses *H13* and *H14*.

A comparison of tables 14.1 and 14.2 confirms that among individualistic employees being subject to a cash bonus scheme was associated with higher effort supplied than owning shares in the company. (EFFORT = 0.6161 for individualists with a cash bonus, compared with 0.5006 for individualists with shares). In addition the increase in effort associated with the presence of the bonus was greater than that associated with share ownership (0.3644, (t = 3.61) compared with 0.2800 (t = 3.037).

Table 14.3:
Effort Reported & Cash bonus & Share Ownership

Group	N	mean EFFORT	(std dev)	t
INDIVIDUALISTIC EMPLOYEES				
(i) neither bonus nor shares	154	0.1646	(0.912)	
				4.68**
(ii) both bonus & shares	55	0.7964	(0.689)	
COLLECTIVISTIC EMPLOYEES				
(i) neither bonus nor shares	145	-0.5377	(0.933)	
				1.61
(ii) both bonus & shares	26	-0.3716	(1.067)	

** significant at over 99 per cent

Table 14.3 shows that the greater the incentive component in pay, the greater is the effort supplied by workers of an

individualistic value set. Individualistic employees covered by both the bonus and share scheme tend to supply substantially more effort than those excluded from both schemes (t = 4.68). For collectivistic workers, however, an increasing incentive element in their pay contract is *not* associated with increases in effort supplied. Table 14.3 provides, therefore, further support for hypothesis *H13* and *H14*.

14.4 Incentive schemes and values: causality

In Section 7.4 we noted the hypothesis that changes in management practice in the last decade have brought about changes in workers' attitudes: specifically policies such as profit-sharing, aligning the interests of the employee and employer, would lead to a reduction in 'them and us' type attitudes. Applied to our analysis this hypothesis can be taken to imply that the introduction of a scheme which makes pay more incentive-based will engender amongst the workforce a value set of calculative individualism. In other words, incentive pay will create the conditions necessary for it to succeed. This was expressed as hypothesis *H12*:

> *H12: Employees covered by a greater incentive-based contract will display greater individualism than those not included.*

The limitations of a cross-sectional research sample are such that we are unable to test this hypothesis rigorously by comparing the change in individualistic values (if any) which

followed the introduction of a new incentive pay scheme. However, a less robust means of testing hypothesis *H12* is possible and may shed some useful light on the question. If incentive-pay schemes brought about a more individualistic value set among the employees to whom they were applied, then hypothesis *H12* would imply that any such employees will have significantly greater individualistic orientations than their counterparts who do not receive incentive pay.

14.4a Causality: values and share-ownership

Table 14.4 summarises the results of comparing the mean value of the individualism-collectivism scale (COLLECT) for two groups of employees: those who own shares in Expamet and those who do not.

Table 14.4:
Values and Share Ownership

Group	N	mean COLLECT	(std dev)	*t*
Own shares	426	0.0796	(0.999)	
				2.13
No shares	412	-0.0669	(0.992)	

* significant at 95 per cent level

Contrary to the prediction of hypothesis *H12*, employee shareholders are significantly *more* collectivistic than non-shareholders.

A possible explanation for this result is that the two groups, shareholders and non-shareholders are not comparable. If

shareholdings were not allocated at random across the workforce, independent factors may explain simultaneously their shareholding status *and* their values orientation.

Appendix Two, however, demonstrates that shares in Expamet were distributed in a particularly even handed way across the workforce. Shares were allocated free of charge to all employees of above two years' standing in the Group in all companies which made a profit in the previous financial year. Consequently distortions occasioned by differential wealth or position in the company, which characterise the pattern of employee shareholding in some companies, were less important in Expamet. This makes the shareholder and non-shareholder groups more comparable than is the typical case.

However, the two years tenure required to qualify for free shares *is* a source of bias between the two groups. Repeating the comparison of means of table 14.4 excluding employees of two years or below tenure controls for this. The results are depicted in table 14.5.

Table 14.5

Values and share ownership: Employees of over 2 years tenure

Group	N	mean COLLECT	(std dev)	*t*
Own shares	400	0.0998	(0.999)	1.73
No shares	182	-0.0563	(1.045)	

Table 14.5 shows that even excluding workers who have not been employed for long enough to qualify for free Expamet shares,

shareholders are more collectivistic than non-shareholders: however, the difference in the mean value of COLLECT is no longer significant at the 95 per cent level.

Subject to the caveat that cross-sectional analysis may conceal *other* differences between the groups which explain their differential individualism, the evidence of tables 14.4 and 14.5 does not support hypothesis *H12*. To the contrary, share-ownership is associated with a value set (collectivism) which is the opposite to that which it might have been expected to foster in employees.

An investigation of these results highlighted a possible explanation of the greater collectivism of employee-shareholders. Shareholding workers overwhelmingly felt that their status in the company should allow them a greater input in decisions which affected their work. Almost five times as many shareholding respondents agreed than disagreed with the statement that "employees who own shares in their own company should have a greater say in decisions which affect their work."[1] The Expamet scheme was not predicated on providing a means for employee-shareholders' voices to be heard.[2] One interpretation of the evidence is that share-ownership raised employees' desire for involvement in the company: since this was not satisfied the scheme did not cement a community of interest between employees and the company. As a result

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[1] 64.9 per cent strongly agreed or tended to agree. 13.4 per cent strongly disagreed or tended to disagree. 20.7 per cent expressed no opinion. N= 568.

[2] Over and above the outlet of the Annual General Meeting.

values associated with sectional interests were strengthened. Over sixty per cent of employee shareholders disagreed that owning shares made them less interested in trade unions, and 56 per cent disagreed that owning shares made them less likely to take industrial action.

While such an explanation is no more than a conjecture, it *is* consistent with the findings of previous *time-series* studies of employee share-ownership programmes. For example, the experience of Baxi Heat, one of the largest examples in Britain of a conversion to employee-ownership, demonstrated that employees whose attitudes were of contentment before the change, developed views which were highly critical of their company's management once they became shareholders, resulting in a heightened 'us and them' orientation among the workforce (Bradley (1988)).

14.4b Causality: values and cash bonus

While our data provides no clear evidence that employee shareholders are more likely than other workers to have a relatively calculative individualistic value set, comparing the recipients of a cash bonus with those not covered by a scheme yielded different results.

Table 14.6
Values and cash bonus

Group	N	mean COLLECT	(std dev)	*t*
Cash bonus	176	0.4534	(0.999)	
				-6.91**
No bonus	658	0.1182	(0.969)	

** significant at over 99 per cent

Table 14.6 shows that the mean value of the COLLECT index for employees in receipt of a cash bonus is significantly lower than that for workers not covered by this incentive. Subject always to the caveat that cross sectional analysis may conceal other explanatory factors which differ between the groups, table 14.6 offers some support for hypothesis *H12*.

The robustness of this finding is demonstrated to some extent by controlling for the level of the employee in the corporate hierarchy. Table 14.7 illustrates that while the typical manager is less collectivistic than the typical shop-floor worker, in both groups those who participate in a cash bonus incentive scheme are more individualistic than their peers who are not covered by a cash bonus system.

Table 14.7
Values and cash bonus

Group	N	mean COLLECT	(std dev)	*t*
MANAGERS				
Cash bonus	53	-0.9778	(0.744)	
				-2.56**
No bonus	57	-0.6010	(0.797)	
SHOPFLOOR				
Cash bonus	71	-0.2425	(0.1017)	
				-4.56**
No bonus	369	0.3203	(0.940)	

The New Industrial Relations hypothesis specified as hypothesis *H12* receives mixed support from our survey. While share-ownership seems to be associated with greater collectivism, the incidence of a cash bonus is strongly associated with individualistic values.

CHAPTER FIFTEEN - CONCLUSIONS

15.1 Introduction

In Chapter One we described two broad objectives for our study. The first was to illustrate the potential for research into incentive payment systems carried out by economists and social psychologists to be viewed as complementary rather than incommensurable. The second was to show that models of effort under incentive payment systems are not universal and ahistoric. Rather they are more powerful predictors of performance at some times and among some people than at others. The individualistic-collectivistic values axis was argued to describe one such boundary condition.

These objectives were to be pursued by means of a positivistic research methodology. Accordingly the arguments were developed and expressed as testable hypotheses. A sample of questionnaire data from 14 operating companies was specified and hypothesized as being sufficient to test the set of hypotheses advanced. Empirical proxies for the variables of the hypotheses were constructed and subjected to attempts at falsification by the data in our sample.

15.2 Summary of Findings

An analysis of neoclassical economic and expectancy theoretic models of effort under incentive pay revealed analogies in

both their content and underlying assumptions. In particular, both traditions were built on assumptions of economic rationality. Taylor (1990, p. 234) identified the "axiomatic and individualist theory of rational action" held by economics as being a major obstacle to attempts to "integrate economic thinking with that of any other area of the social sciences". To find that the expectancy theory tradition of social psychology shares this set of assumptions is therefore to remove this obstacle to building an interdisciplinary approach. Accordingly the theory of motivation supplied by expectancy theory can be seen as compatible with economic models and indeed complementary by opening up the black box of causality. Hence, greater confidence may be placed in empirical tests of economic models if a chain of motivation is simultaneously supported empirically.

The empirical tests of our hypotheses provided useful evidence. Chapter Twelve demonstrated that an additive expectancy-type model of motivated behaviour was predictively more powerful than the traditional multiplicative specification. Since the additive form is more consistent with theories of limited economic rationality (such as Simon's concept of bounded rationality) this result supported our criticism of the usefulness of assumptions of economic rationality in models of incentive pay. After Popper, respecifying the structure of the model was found to be a useful step in enhancing its predictive power.

Evidence was presented in Chapter Thirteen which showed that our expectancy-type model of motivated behaviour was significantly more powerful among employees of relatively individualistic value sets than among those of relatively collectivistic values. Over 37 per cent of variance in our effort measure was explained by our model among individualistic subjects. This figure fell to 17.8 per cent among collectivistic employees. The differential in predictive power was shown to be robust to situational factors such as position in the company, age and level of education attained. This evidence supported our hypothesis that the individualism of employees is an important boundary condition for the applicability of models of incentive pay of this type.

Applying our tests specifically to the two formal incentive pay schemes practised in our sample, cash bonuses and employee shareholdings, we found that effort levels were significantly higher among individualistic employees who received a cash bonus or who owned shares in their company than among their fellow individualists who did not. However, no significant difference could be detected between the effort supplied by those collectivistic employees who owned shares in their company or received a cash bonus, and those who did not. This set of results supported our hypothesis that incentive pay, in keeping with the boundary conditions identified, would motivate higher effort among individualistic subjects, but would not be successful among those characterised by collectivist values. In keeping with the model, cash bonuses,

(where the objective performance-extrinsic reward contingency was more pronounced than that for share ownership) tended to be more successful in motivating higher effort than did employee share ownership. Once again, these results were not undermined by differences in the composition of the compared groups in terms of situational and demographic characteristics.

Finally, in Chapter Fourteen we investigated the possibility that the presence of a formal incentive payment system would be associated with a greater incidence of calculative individualism than among those employees not covered by one of the schemes. That is, can incentive pay bring about the conditions necessary for its own success? Results in this case were ambiguous. Employee shareholders were found to be more *collectivistic* in their orientation than their non-share owning colleagues. Contextual factors were advanced as a possible explanation of this finding. On the other hand employees who were covered by a cash bonus scheme in their company were significantly more individualistic in their values than their counterparts who were not covered by a bonus scheme. This difference was robust to the influence of situational factors such as position in the corporate hierarchy. We felt unable from our evidence to conclude decisively that incentive pay systems bred greater individualism among those exposed to them - a key facet of the New Industrial Relations debate that new management practices will change deep-set worker attributes.

15.3 Implications for Practice

The results of these empirical tests carry important implications for both theory and practice.

For practitioners - firms designing their pay systems to promote greatest effort from their workforce - the results suggest that incentive pay policies will not be universally successful. Among some employees - those characterised by individualistic value sets - incentive pay can be an effective way of increasing effort. Among collectivistic workforces the resources invested into the establishment and operation of an incentive pay scheme could be largely fruitless. Firms will be well advised to ascertain whether their workforce tends to individualism or collectivism in its prevailing values, before deciding to introduce an incentive pay system.

This is not to say that in workplaces characterised by relatively collectivistic values incentive pay schemes can never be introduced. It may be possible for firms to reshape employees' values first, by emphasising individualistic policies and moving away from collectivism. Our results constitute a call for more attention to be paid to design in payment systems. Incentive pay may be successful in certain, individualistic parts of the organization; amongst other workers attention should be paid to devising a more appropriate framework for compensation. Equally as values vary between regions and nations, national and multinational

corporations should recognise the costs of applying a uniform payment system across all of their operations.

In Chapter Two we pointed out that among trends in British industrial relations in the last decade can be discerned a rise in individualistic values and practices at the expense of those associated with collectivism. If this trend continues, then the implication of our results is that incentive models of pay will be properly applicable to an increasing section of the workforce. In planning for the future, therefore, managers responsible for remuneration can expect a growing constituency for *effective* incentive pay innovations.

15.4 Implications for Theory

The empirical tests of our hypotheses have important repercussions for the progress of the theoretical debate on payment systems.

Both economic and social psychological models of incentive pay have been undercut by ambiguous empirical results supplied by tests of their implications. We have demonstrated a common ground between economic and expectancy theoretic models which can be a basis for greater confidence in the effects of incentive pay. Thus if an incentive pay scheme is associated with positive objective performance (for example high productivity), these may be a result of superior management or other variables rather than evidence of a causal power

attributable to incentive pay. If, simultaneously, subjective perceptions are obtained and confirm that the incentive scheme worked by increasing the components of the complementary motivational process, then the role of incentive pay has been isolated. For example, Richardson and Nejad (1986) found that profit-sharing companies' share price performance was superior to that of non profit-sharing companies. Had they simultaneously tested a motivational process and found that expectancies and instrumentalities were higher among profit-sharing companies, greater confidence could be placed in the effects of incentive pay. If expectancies and instrumentalities were no different between profit-sharing and non profit-sharing companies then the superior share price performance of the former group could more confidently be ascribed to factors other than the incentive regime. Thus an interdisciplinary approach, making use of objective and subjective data, can move debates in incentive pay closer to resolution.

A second implication for theory from our empirical results is that theories of incentive pay must pay more explicit attention to their own assumptions, particularly when they are cited in a form which is likely to influence practice. That is, they should attempt to define the boundary conditions within which their ambit runs and their implications are meaningful. Our results show that incentive pay models should not be advanced as universal or ahistoric: the assumptions on which they are based are not always met.

This implication of our analysis goes beyond the universalism of models of incentive pay. As the approach of neoclassical economics is extended to the analysis of more and more aspects of society[1], it is important to make known the limits of the models by specifying the boundary conditions which follow from their underlying assumptions. To fail to do so risks seeing mutable, analytical assumptions evolving, by default, into unquestionable truths. As our analysis has shown, this would be an acceptance of dogma at the expense of models' predictive power.

A third implication for theory is concerned with rising individualism in industrial relations. If we have correctly identified this phenomenon and it continues in the future it implies a qualification of research evidence to date. If incentive pay systems are most effective among people of individualistic value sets, and the proportion of such people in the workforce is increasing then we must expect future tests of the incentive effects to be more supportive of its motivating effects than past tests. Hence the mild or inconclusive results which characterise the body of empirical evidence to date should not be taken to mitigate the expected effects of incentive pay in the future.

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[1] From voting decisions to the decision to marry, (Becker (1976), Downs (1957)).

15.5 Suggestions for Further Work

The evidence which we have reported, while striking, must be considered as being an exercise in basic research in that it constituted a first attempt to formulate and test empirically an important theoretical issue. While the conclusions justified our investigation the issues which we have covered should ideally be taken further in a particular way: the *external* validity of our analysis and conclusions should be probed. That is to say, the opportunity should be taken to apply our hypotheses using empirical proxies which have a context of previous refinement and development. Replicating our study using, for example, Hofstede's (1980) *IDV* index of individualism in the place of our *COLLECT* index of individualism will indicate how dependent our results are on the particular proxy for individualism which we used. Since Hofstede's *IDV* has been demonstrated to be highly correlated with other indices of individualism such a replication could confirm the external validity of our concept and hence our conclusions. Similarly, established indices of expectancy and instrumentality could be substituted for the scales which we have derived and used: further work can refine the measures used and make them commensurable with other empirical work.

The research strategy which we adopted - the secondary analysis of a large dataset - was shown in Chapter Nine to have the advantage of being broad in its scope, covering fourteen companies operating around the country, and all

positions within those companies. Because of the dataset used, we can have greater confidence in claiming generality for our results than would be possible in the context of a simple case study. However, the companies surveyed cannot be argued to be *wholly* representative of British firms: they contained a preponderance of manufacturing companies and employed relatively few female workers (22 per cent of those surveyed), for example. More studies of this type in a diversity of different companies would indicate how generalisable our results are.

Another opportunity for further research is provided by the fact that our dataset applied only to employees in England and Wales. We have, nevertheless, formulated a clear hypothesis that incentive pay systems work best among individualistic employees, and that, after Hofstede, individualism is a key axis of differentiation between the people of different countries. Accordingly a comprehensive evaluation of whether incentive pay motivates more effort among employees in countries characterised by individualism (eg, US, Canada according to Hofstede) than among those of more collectivist workforces (eg, Austria, Spain), is open to future research.

More generally, the greater the number and the more comprehensive are the empirical tests which our hypotheses survive, the more confident we can be in the results of our analysis, and the implications which we have drawn from them. Replicating our analysis in different settings, using time

series as well as cross-sectional data will all assist in turning basic research conclusions into established ones.

The analysis which we have brought to models of incentive pay has an applicability outside this particular set of policies. We have argued that neo-classical economic models, and others which share their methodological assumptions, are subject to a boundary condition of individualistic values characterising those to whom the models are hypothesized to apply. In the light of our discussion, future research could usefully investigate whether respecting this boundary condition does increase the predictive power of such models applied in other areas. For example, the economic analysis of voting behaviour should, after our argument, be predictively a more accurate model of the behaviour of individualistic electors than those of strong community-oriented values. Performing such analyses would advance research by making use of models predictive power while not foreclosing alternative analyses in areas in which the standard assumptions are not met.

APPENDIX 1: POTENTIALLY RELEVANT QUESTIONS IN THE SURVEY

1.	Are you:	Male	1
		Female	2
2.	How long have you worked for your company?		
		Less than 1 year	1
		Less than 2 years	2
		Less than 3 years	3
		Less than 4 years	4
		Less than 5 years	5
		Less than 10 years	6
		Less than 15 years	7
		15 years or more	8
4.	Are you:	20 years or under	1
		Between 21 and 30	2
		Between 31 and 40	3
		Between 41 and 50	4
		51 years or over	5
6.	Is your job:	Full time	1
		Part time	2
9.	At what age did you leave full time education?		
		15 years or before	1
		16 years	2
		17 years	3
		18 years	4
		19 years	5
		20 years	6
		21 years	7
		22 or over	8
13.	Would you describe yourself as:		
		a manager	1
		a supervisor	2
		a clerical worker	3
		other	4

		Strongly Agree	Tend to Agree	Neither Agree nor Disagree	Tend to Disagree	Strongly Disagree
26.	When I do a good job **it gets noticed**	1	2	3	4	5
28.	I am **well paid** for what I do	1	2	3	4	5
29.	I am satisfied with my **basic pay**	1	2	3	4	5

40. Do you receive an annual cash bonus from your company?

Yes 1 (Go to Q41)
No 2 (Go to Q48)

		Strongly Agree	Tend to Agree	Neither Agree nor Disagree	Tend to Disagree	Strongly Disagree
43.	My **annual cash bonus** from my company is a large amount of money to me	1	2	3	4	5
45.	The amount of the annual cash bonus depends a lot on how much effort employees put into their work	1	2	3	4	5
56.	The value of a **share** in Expamet depends a lot in **the work effort of employees**	1	2	3	4	5

60. Do you participate in Expamet's profit sharing scheme?

Yes 1
No 2 [Go to Q67]

		Strongly Agree	Tend to Agree	Neither Agree nor Disagree	Tend to Disagree	Strongly Disagree
64.	In how many different companies, including Expamet do you own shares?	1	2	3	4	5
65.	The number of **shares** I own in Expamet is a	1	2	3	4	5
69.	Owning **shares** is not for the likes of me	1	2	3	4	5
87.	As an individual, I can really make a difference to the success of my work team	1	2	3	4	5
91.	The success of my workplace depends on a **special effort** from its employees	1	2	3	4	5
96.	I **help and encourage** fellow workers in my work team	1	2	3	4	5

		Strongly Agree	Tend to Agree	Neither Agree nor Disagree	Tend to Disagree	Strongly Disagree
97.	It is none of my business if workers in my **work team** sometimes take it easy on the job	1	2	3	4	5
100.	It is important for **employees to do all they can** to increase company profits	1	2	3	4	5
102.	The way I do my job is very important for the **quality** of the work done in my **work team**	1	2	3	4	5
125.	There is a 'them' and 'us' relationship between **department managers** and all other levels of employees	1	2	3	4	5
128.	It is none of my business if workers in my **department** sometimes **take it easy** on the job	1	2	3	4	5
134.	As an individual I can really make a difference to the **success** of my **department**	1	2	3	4	5
137.	My company has an effective system to identify people for **promotion**	1	2	3	4	5
147.	In my company there is a 'them' and 'us' relationship between **very senior managers** and other levels of employees	1	2	3	4	5
195.	Training should lead to an **increase in wages**	1	2	3	4	5
198.	When new equipment is introduced workers' basic pay should be increased	1	2	3	4	5
216.	My company should **increase** the opportunities for paid overtime	1	2	3	4	5

		Strongly Agree	Tend to Agree	Neither Agree nor Disagree	Tend to Disagree	Strongly Disagree
231.	I am **not willing to put myself out** just to help my company	1	2	3	4	5
233.	In my job I like to feel I am making **some effort**, not just for myself but for the company as well	1	2	3	4	5
235.	Should your company have a trade union?	1	2	3	4	5

236. Are you a member of a trade union?

Yes 1
No 2 [Go to Q245]

		Strongly Agree	Tend to Agree	Neither Agree nor Disagree	Tend to Disagree	Strongly Disagree
248.	In general unions and their representatives should have **more more say in decisions** affecting the company as a whole	1	2	3	4	5
250.	**Local trade unions** should have more power and influence in my company	1	2	3	4	5

APPENDIX 2 - EXPAMET'S INCENTIVE PAY SCHEMES

The fourteen companies belonging to Expamet plc operate two formal incentive pay schemes, employee share ownership and cash bonuses. The incidence of each of these policies was recorded in the questionnaire survey.

Employee Shareownership

At the time of the survey in November 1988 Expamet had operated an employee share ownership programme for four years. This was a profit-sharing scheme approved under the Finance Act 1978 which enabled companies to distribute free shares to all employees of over four years employment. Under the Act, employees are unable to deal in the shares during the two year period after allocation. In years 3 and 4 the shares may be sold but the proceeds are taxable at the employee's marginal rate. In year five, 25 per cent of the shares' value may be disposed of tax free, and at the end of the fifth year the employee has no tax liability for his shareholding.

Expamet made allocations available to all UK employees of only two years standing or above, in 1985, 1986, 1987 and 1988. Allocations were salary-related. An employee with a salary of £10,000 per annum who participated in all four distributions and had not sold his shares would own Expamet shares to the value of around £800 at the time of the survey: about eight per cent of his salary.

Employees at Cash and Security Equipment Ltd and C&R Security Systems Ltd joined the Group too late to have participated in the scheme by the time of the survey. Of employees who received allocations in 1985 and 1986, 20 per cent and 13 per cent respectively, had disposed of their holdings at the time of the survey. The survey reported that 48.3 per cent of respondents owned shares in Expamet.

The Board of Expamet introduced the scheme in 1984 with the stated intention of "increasing employee commitment to achieving increasing profitability and growth." [1]

Cash Bonuses

Twenty five per cent of respondents were covered by a cash bonus scheme. These were performance-based systems devised and operated autonomously by the companies surveyed. Because of the variety of schemes practised their incidence was recorded in the survey under the umbrella term cash bonus. The two constituent and principal characteristics of incentive pay which differentiated it from the share ownership scheme was that rewards were in cash, and always referred to the performance of a group smaller than Expamet plc. Twenty per cent of those receiving a cash bonus were identified as managers, 13 per cent as clerical workers, 15 per cent supervisors and 40 per cent shopfloor and other workers.

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[1] Internal memo, 26 June 1988.

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